: 974/3

Vol. 974 Number 3

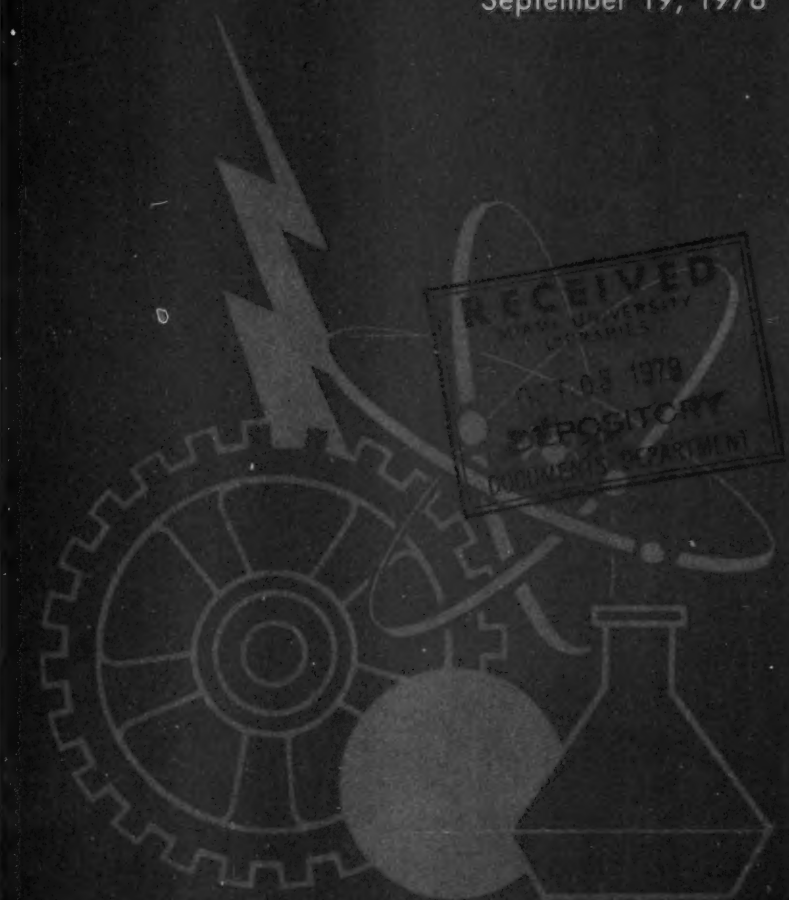
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 19, 1978



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September 19, 1978 Volume 974 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty Information	974 OG 14
Reinstatement of Patent Attorneys and Agents Registered To Practice Before the U.S. Patent and Trademark Office	974 OG 14
Filing Copies of Patent Applications	974 OG 14
Availability of Patent Copies	974 OG 14
Reissue Applications Filed	974 OG 14
Patent Notices	
Certificates of Correction for the Week of Sept. 19, 1978	974 OG 16
Simultaneous Issue of Patents	974 OG 16
Disclaimers	974 OG 16
Disclaimer and Dedication	974 OG 16
Dedications	974 OG 16
National Technical Information Service	974 OG 16
Condition of Patent Applications	974 OG 19
Reissue Patents Granted (29,765)	1131
Plant Patents Granted (4,302)	1135
Patents Granted	
General and Mechanical (4,114,197)	1137
Chemical (4,115,053)	1427
Electrical (4,115,653)	1589
Design Patents Granted (249,396)	1665
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 59
Classification of	
Patents (Including Reissues)	PI 65
Designs and Plants	PI 68
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 69
Designs and Plants	PI 71
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Reinstatement of Patent Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office

Any person whose name has been removed from the Register of Attorneys or the Register of Agents pursuant to 37 CFR 1.347 may request reinstatement on the appropriate register. However, where the long lapse of time since removal or other circumstances indicate that the person may no longer be qualified for registration, the Committee on Enrollment may require the person to again show that he or she satisfies the requirements of 37 CFR 1.341(c) and that registration would be appropriate before reinstatement is granted.

Aug. 21, 1978. LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Filing of Copies of Patent Applications

Beginning on October 1, 1978, the Office will accord a filing date to facsimile or other reproduced copies of United States national patent applications meeting the requirement of 35 U.S.C. 111, *provided:*

(1) the application was properly executed by the inventor(s) prior to transmission of the copy.
(2) the copy filed is a complete copy and bears a reproduction of applicant's signature, and
(3) the originally signed application is filed no later than two months after the facsimile or other reproduced copy is filed.

Authority for this practice is found in 35 U.S.C. 26 as interpreted by the District Court decisions *Neergaard* v. *Dann*, Civil Action No. 76–536, December 20, 1976 (D.D.C.) and *Dietzel et al.* v. *Commissioner of Patents and Trademarks*, Civil Action No. 75–0298, December 22, 1976 (D.D.C.).

In order to ensure prompt association with the copy of the application initially filed it is strongly recommended that the subsequently filed original application be accompanied by a cover letter signed by the applicant or the attorney or agent averring it is the original of the earlier filed facsimile application, identifying the application by applicant's name, title of invention, date of initial filing and serial number, if known.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be used routinely for filing applications.

The above procedure does not apply to international applications filed under the Patent Cooperation Treaty since procedures to cover unsigned international applications are already provided for in PCT Article 14(1)(a)(i) and (b) and PCT Rule 26.2.

DONALD W. BANNER,
Aug. 28, 1978. *Commissioner of Patents and Trademarks.*

Availability of Patent Copies

Copies of patents, granted September 12, 1978 and subsequent thereto, may be available before copies of patents which were granted on Issue Dates during the months of July and August, and the Issue Date of September 5, 1978.

Beginning with the September 12, 1978 Issue Date, the new supplier furnishing these services has indicated that deliveries of patent copies are expected to be on schedule.

The Patent and Trademark Office is still experiencing difficulties in obtaining patent copies from the former supplier for Issue Dates prior to to September 12, 1978, and it is anticipated that these delays will continue through the month of October, 1978.

BRADFORD R. HUTHER,
Deputy Assistant Commissioner for Administration.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,518,492, Re. S.N. 918,295, Filed Jun. 21, 1978, Cl. 361/128, TRIGGERING CIRCUIT FOR SPARK GAP ASSEMBLIES, Stanley A. Miske, Jr., et al., Owner of Record: *General Electric Company, Pittsfield, Mass.,* Attorney or Agent: Francis X. Doyle, et al., Ex. Gp.: 212

3,634,105, Re. S.N. 925,650, Filed Jul. 17, 1978, Cl. 426/549, DEHYDRATED POTATO PROCESSES AND PRODUCTS, Roderick Gerald Beck, et al., Owner of Record: *American Potato Company, Blackfoot, Idaho,* Attorney or Agent: John C. Altmiller, Ex. Gp.: 172

3,814,889, Re. S.N. 929,668, Filed Jul. 31, 1978, Cl. 219/10.55, HEAT TREATMENT OF HEAT-SENSITIVE PRODUCTS, Lennart Arvid Stenstrom, Owner of Record: *Alfa-Laval AB, Tumba, Sweden,* Attorney or Agent: Cyrus S. Hapgood, et al., Ex. Gp.: 213

3,831,763, Re. S.N. 923,625, Filed Jul. 11, 1978, Cl. 210/321, SEPARATION APPARATUS, Jacques Breysse, et al., Owner of Record: *Rhone-Poulenc S.A., Paris, France,* Attorney or Agent: Ellsworth H. Mosher, Ex. Gp.: 176

3,856,273, Re. S.N. 914,990, Filed Jun. 12, 1978, Cl. 366/261, WING TYPE AGITATOR, Billy Leon Born, Owner of Record: *Stoelting Brothers Company, Kiel, Wis.,* Attorney or Agent: Gerrit D. Foster, et al., Ex. Gp.: 242

3,931,963, Re. S.N. 926,151, Filed Jul. 19, 1978, Cl. 270/61, FOLDING MACHINES, Elmer E. Bewersdorf, Owner of Record: *McCain Manufacturing Corporation, Chicago, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 337

3,945,493, Re. S.N. 862,891, Filed Dec. 19, 1977, Cl. 206/386, SHRINK WRAP SYSTEM FOR PRODUCTS ON PALLETS AND SLIP SHEETS, Thomas J. Cardinal, Owner of Record: *The Pillsbury Co., Minneapolis, Minn.,* Attorney or Agent: James V. Harmon, et al., Ex. Gp.: 241

3,969,003, Re. S.N. 923,468, Filed Jul. 10, 1978, Cl. 303/113, ANTI-SKID CONTROL DEVICE AND SYSTEM, Walter H. Morse, et al., Owner of Record: *The Jacobs Manufacturing Company, West Hartford, Conn.,* Attorney or Agent: Ronald A. Schapira, Ex. Gp.: 315

3,998,916, Re. S.N. 929,680, Filed Jul. 31, 1978, Cl. 264/22, METHOD FOR THE MANUFACTURE OF AN ELECTRET FIBROUS FILTER, Jan Van Turnhout, Owner of Record: *N. V. Virto, Rotterdam, Netherlands,* Attorney or Agent: Walter D. Ames, et al., Ex. Gp.: 147

4,007,282, Re. S.N. 924,811, Filed Jul. 14, 1978, Cl. 424/308, LOWERING LIPID AND SUGAR LEVELS IN THE BLOOD WITH A BIS (4-HYDROXYPHENYL) ALKANOIC ACID OR ESTER THEREOF, Otto Mauz, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt am Main, Germany,* Attorney or Agent: Henry W. Koster, Ex. Gp.: 125

4,011,525, Re. S.N. 928,042, Filed Jul. 25, 1978, Cl. 331/94.5 PE, GAS LASER GENERATOR, Bruno Godard, Owner of Record: *Compagnie Generale d'Electricite, Paris, France,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 254

4,015,869, Re. S.N. 926,888, Filed Jul. 21, 1978, Cl. 292/341.16, CATCH MECHANISM, Stephen Horvath, Owner of Record: *Access Control Systems Pty. Ltd., Melbourne, Australia,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 351

4,036,802, Re. S.N. 925,886, Filed Jul. 18, 1978, Cl. 260/296 F, TETRAFLUOROETHYLENE COPOLYMER FINE POWDER RESIN, Robert Victor Poirier, Owner of Record: *E. I. du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Gary A. Samuels, Ex. Gp.: 121

4,041,344, Re. S.N. 927,571, Filed Jul. 24, 1978, Cl. 313/113, ELLIPSOIDAL REFLECTOR LAMP, Frank F. Lagiusa, Owner of Record: *General Electric Company, New York, N.Y.,* Attorney or Agent: Paul F. Wille, et al., Ex. Gp.: 252

4,051,784, Re. S.N. 926,161, Filed Jul. 19, 1978, Cl. 105/131, FLEXIBLE ROTARY COUPLING, Donald L. Ries, Owner of Record: *Rockwell International Corporation, Pittsburgh, Pa.,* Attorney or Agent: Ronald F. Naughton, et al., Ex. Gp.: 314

4,064,900, Re. S.N. 929,678, Filed Jul. 31, 1978, Cl. 137/315, NON-RISE FAUCET ASSEMBLY, William C. Schmitt, Owner of Record: *Milwaukee Faucets, Inc., Milwaukee, Wis.,* Attorney or Agent: Nathan N. Kraus, et al., Ex. Gp.: 341

4,076,779, Re. S.N. 928,290, Filed Jul. 26, 1978, Cl. 264/39, METHOD OF MAINTAINING THE FLUID PERMEABILITY OF A USED CERAMIC FLUID-RELEASE MOLD, Rudolph A. Skriletz, Owner of Record: *Wallace-Murray Corporation, New York, N.Y.,* Attorney or Agent: William E. Schuyler, Jr., et al., Ex. Gp.: 147

PATENT NOTICES

Certificates of Correction for the Week of Sept. 19, 1978

Re.29,600	4,065,577	4,081,277	4,086,343
3,911,191	4,066,760	4,081,278	4,086,563
3,919,173	4,067,228	4,081,413	4,087,005
3,958,827	4,068,211	4,081,790	4,087,032
3,986,057	4,068,493	4,081,791	4,087,320
4,022,958	4,069,774	4,082,020	4,087,450
4,026,085	4,069,983	4,082,145	4,087,463
4,029,213	4,072,553	4,082,146	4,087,564
4,029,909	4,074,600	4,082,343	4,087,638
4,031,012	4,075,725	4,082,759	4,087,693
4,033,411	4,075,866	4,082,935	4,087,715
4,034,093	4,076,792	4,083,523	4,087,788
4,034,302	4,077,367	4,083,789	4,087,809
4,034,505	4,077,663	4,084,326	4,087,907
4,035,710	4,077,842	4,084,408	4,088,045
4,036,765	4,077,927	4,084,490	4,088,154
4,036,954	4,077,966	4,084,576	4,088,324
4,038,256	4,078,281	4,085,012	4,088,419
4,038,324	4,078,553	4,085,073	4,088,502
4,040,885	4,078,938	4,085,074	4,088,506
4,041,251	4,078,996	4,085,123	4,088,883
4,047,027	4,079,060	4,085,178	4,089,102
4,049,645	4,079,534	4,085,193	4,089,176
4,051,066	4,079,944	4,085,388	4,089,285
4,052,298	4,080,086	4,085,391	4,089,360
4,052,365	4,080,175	4,085,438	4,089,409
4,052,991	4,080,283	4,085,854	4,089,503
4,056,619	4,080,341	4,085,962	4,089,773
4,057,431	4,080,496	4,086,046	4,089,954
4,058,621	4,080,547	4,086,050	4,090,208
4,058,657	4,080,661	4,086,065	4,090,317
4,060,550	4,080,939	4,086,071	4,090,328
4,061,739	4,081,004	4,086,109	4,090,612
4,065,439	4,081,019	4,086,142	4,091,144
4,065,493	4,081,275	4,086,173	

Simultaneous Issue of Patents

Applicants and their attorneys who desire the simultaneous issue of allowed applications must submit the request to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Publications
CP–2, Room 5C26

The request must contain the following information about *each* allowed application for which simultaneous issue is requested:

(1) serial number
(2) filing date
(3) name(s) of inventor(s)
(4) title of invention
(5) date of allowance

Separate copies of the request must accompany *each* Issue Fee Transmittal (PTO–85b).

Questions concerning this practice may be directed to Mr. Stanley J. Bania, Director, Office of Publications, Area Code (703) 557–3794.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Aug. 25, 1978.

Disclaimers

3,928,855.—*Edward F. Helinski*, Johnson City, and *Ho C. Lee*, Endicott, and *Jack L. Zable*, Vestal, N.Y. METHOD AND APPARATUS FOR CONTROLLING SATELLITES IN AN INK JET PRINTING SYSTEM. Patent dated Dec. 23, 1975. Disclaimer filed July 3, 1978, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3 and 17 of said patent.

3,939,261.—*Jordan B. Barth*, East Brunswick, N.J. FLAVORED DENTIFRICE. Patent dated Feb. 17, 1976. Disclaimer filed Aug. 2, 1978, by the assignee, *Colgate-Palmolive Company.*

Hereby enters this disclaimer to claim 15 of said patent.

4,088,855.—*William Boyd Emery*, Kirkland Wash. KEYBOARD ELECTRO-MECHANICAL SWITCH WITH COIL SPRING CONTACT. Patent dated May 9, 1978. Disclaimer filed July 27, 1978, by the assignee, *Korry Manufacturing Co.*

Hereby enters this disclaimer to claim 11 of said patent.

Dedication

3,995,114.—*Richard E. Marschinke*, St. Paul, Minn. ULTRA LOW CURRENT AMPLIFIER. Patent dated Nov. 30, 1976. Dedication filed July 24, 1978, by the assignee, *Dahlberg Electronics, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimer and Dedication

3,937,956.—*Richard K. Lyon*, Fanwood, N.J. ISOTOPE SEPARATION PROCESS. Patent dated Feb. 10, 1976. Disclaimer and dedication filed July 24, 1978, by the assignee, *Exxon Research and Engineering Company.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 769,124. Thorium Doped Tridium Alloy for Radioisotope Heat Sources. Filed Feb. 16, 1977.

Patent application 776,383. Nuclear Waste Storage Container with Metal Matrix. Filed Mar. 10, 1977.

Patent application 782,873. Method for Selectively Reducing Plutonium Values by a Photochemical Process. Filed Mar. 30, 1977.

Patent 4,042,876. Eddy Current Gauge for Monitoring Displacement Using Printed Circuit Coil. Filed Apr. 19, 1976. Patented Aug. 16, 1977. Not available NTIS.

Patent 4,045,289. Nuclear Reactor Containment Structure with Continuous Ring Tunnel at Grade. Filed Oct. 22, 1976. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,046,169. Pipe Support for Use in a Nuclear System. Filed July 9, 1975. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,690. Filtering Coal-Derived Oil Through a Filter Media Precoated with Particles Partially Solubilized by Said Oil. Filed Apr. 1, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,049,864. Penetration Resistant Barrier. Filed Feb. 12, 1976. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,055,247. Explosion Containment Device. Filed Oct. 22, 1976. Patented Oct. 25, 1977. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 903,518. Automatic Base Gate Positioning Circuit. Filed May 16, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 817,094. Intermediates for Total Steroid Synthesis from the Condensation Product of Dimethyl 3-Ketoglutarate and Glyoxal Useful as Precursors for the Total Synthesis of Steroids. Filed July 19, 1977.

Patent 4,069,241. Steroidal Intermediates from the Condensation Product of Dimethyl-3-Ketoglutarate and Glyoxal. Filed May 26, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,073,885. Anodynin, an Endogenous Opiate Analgesic from Human Blood, and Process for Recovering Same. Filed Sept. 10, 1976. Patented Feb. 14, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., Washington, D.C. 20240

Patent 4,053,377. Electrodeposition of Copper. Filed Feb. 13, 1976. Patented Oct. 11, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA Code GP–2, Washington, D.C. 20546

Patent application 862,878. System and Method for Refurbishing and Processing Parachutes. Filed Dec. 21, 1977.

Patent application 876,432. Dielectric-Loaded Waveguide Circulator for Cryogenically Cooled and Cascaded Maser Waveguide Structures. Filed Feb. 9, 1978.

Patent Application 885,065. Apparatus for Measuring an Aircraft's Speed and Height. Filed Mar. 9, 1978.

Patent application 888,432. System for Forming a Quadrifid Image Comprising Angularly Related Fields of View of a Three Dimensional Object. Filed Mar. 20, 1978.

Patent application 889,670. Fatigue Failure Load Indicator. Filed Mar. 24, 1978.

Patent application 891,245. Process for Curing Epoxides with Diamines, Filed Mar. 29, 1978.

Patent application 891,356. Distributed-Switch Dicke Radiometer. Filed Mar. 29, 1978.

Patent application 891,370. Closed Loop Solar Array-Ion Thruster System with Power Control Circuitry. Filed Mar. 29, 1978.

Patent application 891,372. A Retractable Environmental Seal. Filed Mar. 29, 1978.

Patent application 893,383. Structural Members, Method and Apparatus. Filed Apr. 4, 1978.

Patent application 893,865. Improved Tire/Wheel Concept. Filed Apr. 6, 1978.

Patent application 897,829. In situ Self Cross-Linking of Polyvinyl Alcohol Battery Separators. Filed Apr. 19, 1978.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent 3,987,003. Thermally Stable Dioxo and Dithio-Benziso-quinoline Compositions and Process of Synthesizing Same. Filed June 6, 1975. Patented Oct. 19, 1976.

Patent 3,992,995. Speed Controlled Second Event Launcher. Filed Sept. 4, 1975. Patented Nov. 23, 1976.

Patent 3,993,269. Toroidal Tail Structure for Tethered Aeroform Balloon. Filed Dec. 18, 1975. Patented Nov. 23, 1976.

Patent 3,993,890. Combinatorial Digital Filter. Filed Sept. 29, 1975. Patented Nov. 23, 1976.

Patent 3,993,962. Low Noise Parametric Varactor Diode Crystal Oscillator. Filed Aug. 18, 1975. Patented Nov. 23, 1976.

Patent 3,993,976. Method and Apparatus for Pattern Analysis. Filed May 13, 1974. Patented Nov. 23, 1976.

Patent 3,993,994. Adaptive Clutter Cancellation for Synthetic Aperture AMTI Radar. Filed June 27, 1975. Patented Nov. 23, 1976.

Patent 3,994,165. Mass Flowmeter Starting System. Filed Nov. 25, 1975. Patented Nov. 30, 1976.

Patent 3,994,861. Long Chain-Perfluoroalkylene Ether Bibenzoxazole Polymers. Filed Sept. 4, 1975. Patented Nov. 30, 1976.

Patent 3,995,213. Surface Impedance Tester. Filed Oct. 2, 1975. Patented Nov. 30, 1976.

Patent 3,995,229. High Slew Rate Operational Amplifier Circuit. Filed May 27, 1975. Patented Nov. 30, 1976.

Patent 3,995,271. Adaptive Clutter Cancellation and Interference Rejection System for AMTI Radar. Filed Aug. 20, 1975. Patented Nov. 30, 1976.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent 3,974,457. Time and Frequency Control Unit. Filed Sept. 19, 1975. Patented Aug. 10, 1976.

Patent 3,976,274. Permanent Attachment for Suction Cups. Filed May 27, 1975. Patented Aug. 24, 1976.

Patent 3,976,962. Dual Threshold Magnetic Proximity Switch. Filed Apr. 25, 1975. Patented Aug. 24, 1976.

Patent 3,976,968. Underwater Target Detection Apparatus. Filed Nov. 19, 1954. Patented Aug. 24, 1976.

Patent 3,977,149. Multipurpose Construction Panel. Filed Mar. 28, 1975. Patented Aug. 31, 1976.

Patent 3,978,488. Offset Fed Electric Microstrip Dipole Antenna. Filed Apr. 24, 1975. Patented Aug. 31, 1976.

Patent 3,980,905. Apparatus and Method for Tuning a Broad Bandwidth Transducer Array. Filed Oct. 19, 1973. Patented Sept. 14, 1976.

Patent 3,982,810. Directional Radiation by Asymmetrical Dielectric Gratings. Filed July 9, 1975. Patented Sept. 28, 1976.

Patent 3,983,750. Fluid Level Sensing Device. Filed Sept. 29, 1975. Patented Oct. 5, 1976.

Patent 3,984,673. External Lighting System for Hypobaric and Hyperbaric Chambers. Filed June 30, 1975. Patented Oct. 5, 1976.

Patent 3,984,834. Diagonally Fed Electric Microstrip Dipole Antenna. Filed Apr. 24, 1975. Patented Oct. 5, 1976.

Patent 3,986,745. Grabber. Filed Aug. 25, 1975. Patented Oct. 19, 1976.

Patent 3,987,741. Remote Unmanned Work System (RUWS) Matching Latch. Filed Jan. 12, 1976. Patented Oct. 26, 1976.

Patent 3,988,732. 3-Channel Selectable Polarization, Target Discrimination Antenna. Filed Dec. 22, 1965. Patented Oct. 26, 1976.

Patent 3,989,475. Composite Superconductors. Filed May 30, 1975. Patented Nov. 2, 1976.

Patent 3,990,344. Underwater Expendable Explosive Link. Filed Jan. 13, 1975. Patented Nov. 9, 1976.

Patent 3,990,811. Circulation Controlled Rotary Wing Aircraft and Control System Therefor. Filed Feb. 26, 1975. Patented Nov. 9, 1976.

Patent 3,991,372. Circuit for Reversing Doppler Signal Modifying a Carrier. Filed Sept. 24, 1975. Patented Nov. 9, 1976.

Patent 3,994,187. Epicyclic Transmission. Filed Feb. 14, 1975. Patented Nov. 30, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA Code GP–2, Washington, D.C. 20546

Patent 3,987,630. Mechanical Thermal Motor. Patented Oct. 26, 1976.

Patent 3,988,677. Space Communication System for Compressed Data with a Concatenated Reed-Solomon-Viterbi Coding Channel. Patented Oct. 26, 1976.

Patent 3,988,716. Computer Interface System. Patented Oct. 26, 1976.

Patent 3,988,729. Differential Pulse Code Modulation. Patented Oct. 26, 1976.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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California	Los Angeles Public Library	(213) 626-7555 Ext. 274
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 12, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-12-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordinance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-28-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-23-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-18-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-24-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-8-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,994,087 to 2,998,605, inclusive
Plant Patents..... Numbers 2,085 to 2,094, inclusive

REISSUES

SEPTEMBER 19, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

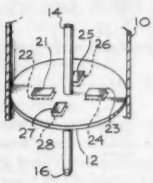
Re. 29,765
STRAIN GAUGE TRANSDUCER SYSTEM

Hewitt D. Crane, Portola Valley; Jon C. Taenzer, Palo Alto, and Gerry B. Andeen, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Original No. 3,915,015, dated Oct. 28, 1975, Ser. No. 451,846, Mar. 18, 1974. Application for reissue Oct. 21, 1977, Ser. No. 844,276

Int. Cl.[2] **G01L** *5/16*

U.S. Cl. 73—432 R **9 Claims**



9. Apparatus for generating signals representative of the force on and direction of motion of a writing instrument used for writing, comprising

a shaft having writing means at one end thereof,

flexible diaphragm means,

means for coupling said shaft to said flexible diaphragm means at a location spaced from said one end to cause strains within said diaphragm responsive to pressure on and motion of said writing means,

supporting means for supporting said flexible diaphragm means with said writing means spaced from said supporting means,

a plurality of strain gauge means attached to at least one surface of said flexible diaphragm means and disposed at locations on said flexible diaphragm to which said shaft is coupled for generating signals representative of the strains within said diaphragm, and

circuit means for combining said strain gauge means signals for producing signals representative of the force on and direction of motion of said writing means.

Re. 29,766
METHOD OF AND MEANS FOR TREATING BURN VICTIMS

Ronald H. Wideman, Menasha, Wis., assignor to Poly-Wide, Inc., Menasha, Wis.

Original No. 3,985,130, dated Oct. 12, 1976, Ser. No. 575,413, May 7, 1975. Application for reissue Mar. 30, 1977, Ser. No. 782,720

Int. Cl.[2] **A61B** *19/06*

U.S. Cl. 128—132 D **27 Claims**

1. A method of treating and providing custodial care for burn and decubitus patients comprising interposing between a patient and a surface on which he is supported a generally nonadhering disposable laminated fabric having outer layers of nonwoven non-migrating fibrous material and an inner layer of foam material therebetween fastened by an adhesive to the outer layers over their entire extent.

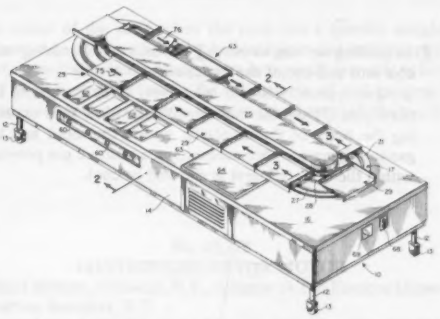
Re. 29,767
APPARATUS AND METHOD FOR USE IN ASSEMBLING FOOD ON TRAYS

Max Gerald Futch, 332 Wilton Dr., Baton Rouge, La. 70815

Original No. 3,926,489, dated Dec. 16, 1975, Ser. No. 512,001, Oct. 4, 1974. Application for reissue Apr. 4, 1977, Ser. No. 783,986

Int. Cl.[2] **B65C** *15/00;* **A47B** *91/00*

U.S. Cl. 186—1 D **17 Claims**



1. A device for use in making up serving trays with food portions comprising:

a. a cabinet assembly having two spaced apart, longitudinally extending, generally flat top counter surfaces;

b. a hollow, narrow, elongated, serving tray conveyer assembly centrally and longitudinally fixedly positioned between said two top surfaces and extending upwardly a substantial distance therefrom,

i. said tray conveyer assembly having end and sidewalls extending upwardly from said top surface, a continuous shelf projecting outwardly from said end and sidewalls adjacent their upper ends, a plurality of tray support means supported by said shelf for movement thereover, and means located in the upper portion of said tray conveyer assembly for moving said plurality of tray support means around a closed path; and

c. each of said two top surfaces of said cabinet providing means for accommodating a plurality of bulk or individually portioned food containers for placement of individual portions on each of said serving trays by an attendant.

Re. 29,768
BLOW-MOLDING APPARATUS

Johannes S. Mehnert, Ernststrasse 11, 5205 St. Augustin-Menden, Fed. Rep. of Germany

Original No. 3,884,610, dated May 20, 1975, Ser. No. 334,134, Feb. 20, 1973. Application for reissue May 20, 1977, Ser. No. 798,909

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1972, 2208165

Int. Cl.[2] **B29C** *5/06*

U.S. Cl. 425—535 **6 Claims**

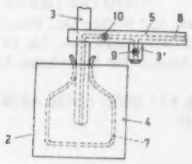
1. Blow-molding apparatus for the fabrication of a hollow body of thermoplastic material within a blow mold, the body being subsequently released from the mold, comprising:

a. a conventional blow pipe (3) capable of providing a first stream of gas,

b. a guide (5) for selectively implanting the blow pipe into

the mold and extracting the blow pipe from the mold before the body is released from the mold,

c. a gas-supplying member of simple construction (3') [mounted on the guide and] separate from the blow pipe, the member being capable of supplying a second stream of gas to the mold after the removal of the blow pipe,



[the guiding serving to move] the said member *being movable* into and out of the mold, and

d. a valve system (9,10) for selectively directing gas to the blow pipe (3) and the member (3'), the blow pipe expanding the body of thermoplastic within the mold and the gas-supplying member maintaining a positive gas pressure within the body while it is allowed to cool.

Re. 29,769

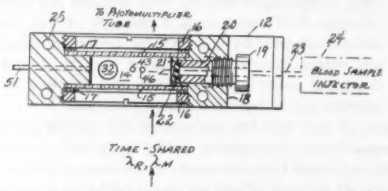
METHOD AND APPARATUS FOR DERIVING OXYGEN ASSOCIATION RATE CURVES FOR BLOOD SAMPLES

Lutz A. Kiesow, Bethesda, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 3,854,878, dated Dec. 17, 1974, Ser. No. 351,014, Apr. 13, 1973. Application for reissue Dec. 14, 1976, Ser. No. 750,503

Int. Cl.[2] **G01N** *21/24, 33/16*

U.S. Cl. 23—230 B **17 Claims**



6. A method of deriving oxygen association curve information for a blood sample, said method comprising disposing a blood sample within a treatment cell, introducing available oxygen into said cell in a first concentration, varying said first concentration of oxygen within said cell over a period of time to provide exposure of said blood sample to varying concentrations of oxygen, passing first and second light beams through said sample during said time period, said first light beam having a wavelength such that there is substantially no difference in absorbance of said wavelength by said blood sample in the oxygenated and deoxygenated states, respectively, of said blood, said second light beam having a wavelength such that there is a relatively large difference in absorbance of said wavelength by said blood sample in the oxygenated and deoxygenated states, respectively, of said blood, and determining the changes in oxygen association of said blood with respect to the changes in oxygen concentration within said cell by sensing the differences in the respective degrees of absorption of said first and second beams by said blood as said oxygen concentration is changed.

Re. 29,770

MANUFACTURE OF FIBERBOARD ACCORDING TO THE WET METHOD WITH CLOSED BACKWATER SYSTEM

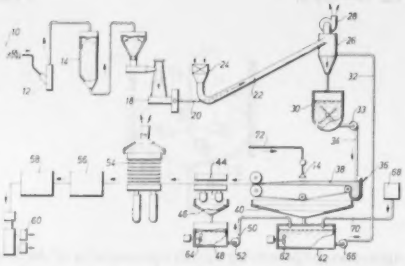
Stig Daniel Selander, 5 Fredrikshovsgatan, 115 22 Stockholm, Sweden; Bernard Marechal, Casteljaloux, and Corrado D'Andrea, Arpajon, both of France, assignors to Isorel S.A., Puteaux, France and Stig Daniel Selander, Stockholm, Sweden

Original No. 3,966,540, dated Jun. 29, 1976, Ser. No. 504,739, Sep. 10, 1974. Application for reissue Aug. 15, 1977, Ser. No. 824,853

Claims priority, application Sweden, Sep. 14, 1973, 7312580

Int. Cl.[2] **D21C** *3/00*

U.S. Cl. 162—13 **4 Claims**



1. In the method of manufacturing wood fibreboard according to the wet system with closed white water system including defibrating lignocellulose material, diluting the defibrated material in water serving as the transporting medium, forming wet sheets from the diluted pulp, mechanically separating white water obtained from the formation of wet sheets and recirculating it to the dilution stage and final drying by evaporation of water from the wet sheets, the production of fibreboard having enhanced appearance while maintaining a closed white water system with reduced discharge of pollutants to the environment including drying the incoming lignocellulose material, prior to the dilution step, to a [dry content from 60 percent to 75 percent] *dryness* which is higher than the dryness of the wet sheet prior to the time it enters the final drying stage, the improvement comprising adding formaldehyde to the white water, homogenizing the white water containing said formaldehyde to a degree such that occurring precipitations are atomized prior to using it for dilution of incoming fibre material.

Re. 29,771

FLUE GAS DESULFURIZATION SORBENT

Neville L. Cull, Baker, and Warren M. Smith, Baton Rouge, both of La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Original No. 4,039,478, dated Aug. 2, 1977, Ser. No. 540,225, Jan. 10, 1975. Division of Ser. No. 315,590, Dec. 15, 1972, abandoned. Application for reissue Sep. 19, 1977, Ser. No. 834,528

Int. Cl.[2] **B01J** *29/06, 23/08*

U.S. Cl. 252—455 R **19 Claims**

13. A porous non-acidic solid sorbent for flue gas desulfurization comprising:

a. a porous alumina base;

b. a coating of *up to about 5% by weight, based on said alumina, of silica, said silica being formed in situ by hydrolysis and subsequent calcination of a hydrolyzable silicon compound or a coating of* about 2% to about 20% by weight, based on said alumina, of a refractory oxide, said oxide being formed in situ by hydrolysis *and subsequent calcination* of a hydrolyzable organic compound *of a metal selected from the group consisting of Group IIIB, IVB and VB metals*, the coated alumina base being non-acidic; and

c. a material active for the selective removal of sulfur oxides from gas mixtures, said active material being a metal or metal oxide.

19. A composition according to claim 13 in which the active material is copper oxide.

Re. 29,772
URETHANE ELASTOMER WITH ACTIVE HYDROGEN CONTAINING MONOETHYLENICALLY UNSATURATED MONOMER

Warren D. Niederhauser, Meadowbrook; William Bauer, Jr., Huntingdon Valley; Constance A. Lane, Philadelphia, all of Pa., and Hector Belmares-Sarabia, Villa de Guadalupe, Mexico, assignors to Rohm and Haas Company, Philadelphia, Pa.

Original No. 3,641,199, dated Feb. 8, 1972, Ser. No. 839,655, Jul. 7, 1969. Application for reissue Nov. 20, 1972, Ser. No. 308,078

Int. Cl.[2] **C08L** *75/00*

U.S. Cl. 260—859 R **28 Claims**

1. As a composition of matter, a condensation product

(A) a reaction product of

(1) diisocyanate selected exclusively from aliphatic and cycloaliphatic diisocyanate,

(2) a linear condensation polymer containing terminal hydroxyl groups and

(3) a polyol having at least two hydroxyl groups, the ratio [n]of (1) to the total of (2) and (3) being in the range of 1.001 to 2.0 equivalents of (1) per equivalent of the total of (2) and (3) and sufficient to provide in the reaction product an equivalent weight as determined by isocyanate titration of at least 4,000, the amount of (3) relative to (2) on an equivalent basis being between 0.1:0.9 and 0.9:0.1, with

(B) a reactive hydrogen-containing monoethylenically insaturated monomer in which the reactive hydrogen is in a hydroxyl or amine group,

an excess of (B) being used to effect reaction of all the isocyanate groups in (A).

Re. 29,773
PROCESS FOR PRODUCING POTATO CHIPS

Lawrence W. Wisdom, and Barney W. Hilton, both of Dallas, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Original No. 3,835,222, dated Sep. 10, 1974, Ser. No. 760,736, Sep. 18, 1968. Application for reissue Jun. 9, 1976, Ser. No. 694,310

Int. Cl.[2] **A23L** *1/12*

U.S. Cl. 426—49 **20 Claims**

7. A process for the production of a fried potato product from potatoes containing in excess of 0.2 percent by weight of reducing sugars which comprises forming a *potato* dough comprising said potatoes, *water* and yeast, said yeast being present in an amount sufficient to ferment said reducing sugars, allowing said dough to ferment for a time sufficient to lower the reducing sugar content *to* below about 0.2 percent by weight [of] *based on* said potatoes, forming the dough into shaped bodies and frying said shaped bodies.

Re. 29,774
ELONGATED TEXTILE PRODUCT

Roger Vidal, Champagne, and Raymond Gourmandy, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

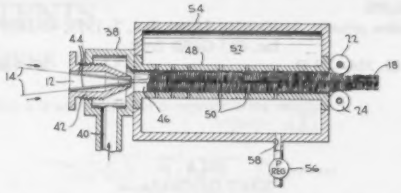
Original No. 3,946,133, dated Mar. 23, 1976, Ser. No. 427,344, Dec. 21, 1973. Division of Ser. No. 188,775, Oct. 13, 1971, Pat. No. 3,827,113. Application for reissue Oct. 18, 1977, Ser. No. 843,350

Claims priority, application France, Oct. 15, 1970, 70.38079; Oct. 15, 1970, 70.38080; Jun. 22, 1971, 71.22959

Int. Cl.[2] **D02G** *1/20, 3/02;* **D04H** *17/00*

U.S. Cl. 428—400 **2 Claims**

1. A textile product formed of a plurality of texturized, continuous filament, polyamide yarns each having a titre of less than 200 dtex, which are configured into a cylindrical pack having a substantially smooth, continuous peripheral surface, said cylindrical pack having sufficient cohesion to resist rupture until stressed by a weight in excess of a predetermined weight, said predetermined weight being at least the weight of



one meter of the pack when the pack has a specific weight greater than 0.3 grams per cubic centimeter and wherein said yarns composing said pack separate into parallel strands, when said pack is stressed with a force in excess of said predetermined weight but less than a force required to break the yarns.

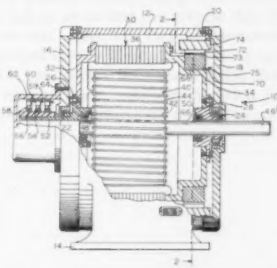
Re. 29,775
CONTROLLED ROTOR MOTOR

Robert Helmer, Setauket, N.Y., assignor to The Enercon Corporation, Setauket, N.Y.

Original No. 3,885,205, dated May 20, 1975, Ser. No. 307,013, Nov. 16, 1972. Application for reissue Apr. 11, 1977, Ser. No. 786,371

Int. Cl.[2] **H02K** *17/00*

U.S. Cl. 318—302 **7 Claims**



1. An electric motor for driving a mechanical load comprising: a stationary housing; a first rotatable means [wholly comprising the secondary of said motor] extending axially of said housing and being rotatable in a selected direction for driving said load; a second rotatable means [having slotted laminations and field coil windings therein] surrounding said first rotatable means and extending axially in said housing for magnetically rotating said first rotatable means in one direction when said first rotatable means coupled to said load, a hardened high hysteresis steel ring being mounted on said second rotatable means for rotation therewith; said second rotatable means being rotatable in a direction opposite to that of said first rotatable means; control means comprising a plurality of electromagnets mounted on said stationary housing *in juxtaposition to said steel ring* for retarding the rotation of said second rotatable means to vary the speed of rotation of said first rotatable means in said selected direction[.], *while maintaining substantial constant driving torque to said load at all rotational speeds of said first rotatable means.*

Re. 29,776

EXPOSURE CONTROL DEVICE

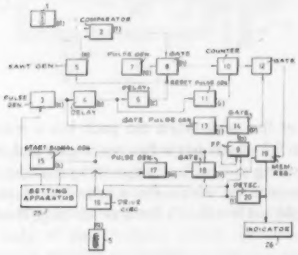
Yutaka Kohtani, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,742,826, dated Jul. 3, 1973, Ser. No. 103,108, Dec. 31, 1970. Application for reissue Jun. 26, 1975, Ser. No. 590,690

Claims priority, application Japan, Jan. 7, 1970, 45-2456

Int. Cl.² G03B 7/08

U.S. Cl. 354—23 D **27 Claims**



11. A photographic camera system, comprising;

photo-electric means for converting a brightness of the object to be photographed into a first electrical signal having a value corresponding to the brightness;

(b) a pulse generator;

(c) memory means connected to said pulse generator, said memory means counting the pulses from the pulse generator and memorizing the pulses from the pulse generator;

(d) means for generating an electrical comparison signal;

(e) comparator means connected to said photo-electric means and said comparison signal generating means, said comparator means comparing the first electrical signal of said photo-electric means with the electrical comparison signal of said comparison signal generating means and producing a control signal when the difference between two signals reach a predetermined value;

(f) gate means coupling said pulse generator to said memory means and connected to said comparator means for preventing transmission of the pulses from said pulse generator to said memory means in response to a control signal from comparator, whereby the counted pulses are memorized in said memory means;

(g) an electrically controlled exposure defining device; and

(h) control means connected to said memory means for controlling an exposure on the basis of the number of the pulses memorized in said memory means.

PLANT PATENTS

GRANTED SEPTEMBER 19, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,302
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Nov. 18, 1976, Ser. No. 743,150
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Pennsylvania and particularly characterized as to novelty by the combined characteristics of relatively large star-shaped flowers having a red-purple flower color; shiny foliage; fast and vigorous growth; very strong and upright stems; long blooming period and non-dropping flowers.

4,303
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,853
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name California and particularly characterized as to uniqueness by the combined characteristics of upright, strong flower stems each of which carries up to ten generally purple flowers; vigorous growth habit, upright, strong peduncle, medium green foliage, long blooming period, strong and robust flowerhead, and by its saleability after the first flash of flowers.

4,304
ALMOND TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Sep. 6, 1977, Ser. No. 831,099
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, as shown and described, characterized by the tree being of medium size and vigor, medium upright in growth, having a heavy set of bloom, blooming a few days before Mission, and a heavy and regular bearer of medium size nuts, which are well distributed along the branches and are easy to harvest and hull; the variety being self-fertile and harvesting with Nonpareil.

4,305
MINIATURE ROSE PLANT

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed Apr. 27, 1977, Ser. No. 791,637
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, essentially as illustrated and described, characterized by buds and flowers resembling the miniature rose 'Over The Rainbow' in size and color effect, but the present variety being more brilliantly orange color on top side of petals and the reverse side of petals being light yellow to near white; and further characterized by flowers of symmetrical form with excellent lasting quality both on the plant and as cut flowers; the variety is also characterized by a vigorous, healthy plant, easily propagated from cuttings, which flowers almost continuously during the growing season.

PATENTS

GRANTED SEP. 19, 1978

ERRATA

For CLASS	See PATENT NO.
405–094	4,114,381
405–282	4,114,383
405–260	4,114,384
405–298	4,114,385
405–150	4,114,386
405–293	4,114,387
405–216	4,114,388
405–186	4,114,389
405–163	4,114,390
405–176	4,114,391
405–207	4,114,392
114–264	4,114,393
405–025	4,114,394
072–122	4,114,431
072–135	4,114,432
180–155	4,114,724
400–279	4,114,750
400–249	4,114,751
229–044 CB	4,114,777
220–408	4,114,784
224–455	4,114,838
408–014	4,115,017
408–239 A	4,115,018
422–133	4,115,066
422–056	4,115,067
422–056	4,115,068
422–112	4,115,069
422–142	4,115,070
422–179	4,115,071
422–207	4,115,072
250–527	4,115,280
528–090	4,115,295
528–092	4,115,296
521–032	4,115,297
521–170	4,115,299
521–171	4,115,300
521–155	4,115,301
521–115	4,115,302
521–053	4,115,303
521–167	4,115,304
260–002.3	4,115,298
260–006	4,115,305
528–018	4,115,356
528–294	4,115,357
528–196	4,115,358
528–170	4,115,359

ERRATA—Continued

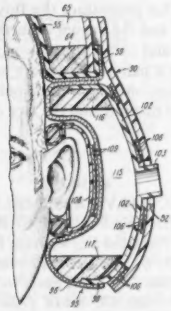
528–094	4,115,360
528–111	4,115,361
528–190	4,115,362
528–294	4,115,363
528–132	4,115,365
528–131	4,115,366
528–210	4,115,367
528–229	4,115,368
526–065	4,115,369
528–279	4,115,371
528–073	4,115,372
528–048	4,115,373
252–432	4,115,424
562–498	4,115,438
562–402	4,115,439
562–533	4,115,440
562–534	4,115,441
562–548	4,115,442
562–402	4,115,443
568–847	4,115,458
340–147 CV	4,115,849

PATENTS

GRANTED SEPTEMBER 19, 1978

GENERAL AND MECHANICAL

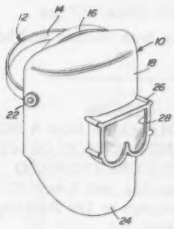
4,114,197
INTER-LINER FOR A SAFETY HELMET AND METHOD OF ASSEMBLY
William G. Morton, Box 841, Hopewell, Va. 23860
Continuation-in-part of Ser. No. 721,871, Sep. 9, 1976, Pat. No. 4,044,399, which is a continuation-in-part of Ser. No. 570,712, Apr. 23, 1975, Pat. No. 3,992,721, which is a continuation-in-part of Ser. No. 360,950, May 16, 1973, Pat. No. 3,882,546, which is a continuation-in-part of Ser. No. 323,195, Jan. 12, 1973, abandoned. This application Aug. 17, 1977, Ser. No. 825,405
Int. Cl.[2] A42B *1/08*
U.S. Cl. 2—423 **11 Claims**

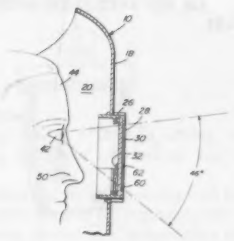


1. A helmet assembly comprising a dome-shaped outer shell of substantially rigid material, a headpiece liner unit within said outer shell and including a dome-shaped inner shell of generally uniform thickness, a deformable cap-like headpiece positioned within said inner shell to define a dome-shaped cavity between said headpiece and said inner shell, said headpiece being effective to contact the wearer's head and to conform to the contour of the wearer's head over the entire area covered by said headpiece, means for securing the lower edge portion of the headpiece to the corresponding lower edge portion of the inner shell, means for introducing an expandable foam material into the cavity of said headpiece liner unit, a pair of earpiece liner units disposed within said outer shell below said headpiece liner unit, each said earpiece liner unit including a deformable earpiece material connected to a base member to define a cavity therebetween, and means for introducing an expandable foam material into the cavity of each said earpiece liner unit.

4,114,198
WELDER'S HELMET LENS
Jessie E. Sands, 1719 Maple St., Russell, Kans. 67665
Filed Mar. 25, 1977, Ser. No. 781,527
Int. Cl.[2] A61F *9/06*
U.S. Cl. 2—8 **3 Claims**

1. A protective guard for welders, said guard including a support frame for placement over and support from the upper portion of a welder's head, said frame including opposite side portions, a rearwardly opening upstanding shield, means pivotally supporting said shield from said opposite side portions for angular displacement relative to said frame about a horizontal transverse axis and with at least the forward portion of said frame disposed within said rearwardly opening shield, said shield being oscillatable relative to said frame between an upstanding position and a rearwardly and upwardly inclined position with the upper portion of said shield swung rearwardly and upwardly and the lower portion of said frame swung forwardly and upwardly, said shield including aperture defining means defining a viewing aperture therein below the level of said axis when said shield is in said upstanding position and to be disposed forwardly of the wearer's face and in horizontal registry with the eyes of the wearer of said frame when said shield is in said upstanding position, the upper margin of said viewing aperture being at an elevation to be at least horizontally aligned with straight forward vision of the eyes of said wearer, the portion of said aperture defining means defining the lower margin of said viewing aperture including opposite



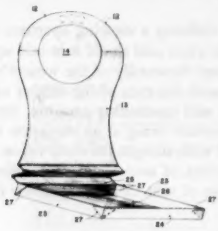


side portions depressed downwardly sufficiently to provide unobstructed vision of said wearer when the latter is viewing through the lower portions of bifocal glasses and a central portion upwardly displaced relative to said depressed opposite side portions to be positioned above the nostril level of said wearer as well as forward of the nose of the wearer, and a light filtering panel closing said aperture, said aperture defining means being mounted from said shield for positioning forwardly of the face of the user to facilitate free circulation of air within said shield adjacent the nose and eyes of the wearer.

4,114,199
DISPOSABLE BIB TRAY
Mabel Malan, 420 C'lege Park Dr., Lynchburg, Va. 24502
Filed Ma. . 30, 1977, Ser. No. 782,700
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—49 A **7 Claims**

1. A bib-tray for use during the feeding of an infant, fabricated of suitably stiff and tear resistant thin sheet material cut and folded so as to comprise a bib portion having neck-fastening means at its uppermost end which enclose an opening of adjustable size, and an apron portion, a series of parallel accordian folds positioned at the bottom of said bib portion as a continuous extension thereof, said accordian folds being formed by folding said sheet material along at least five parallel lines, and a tray portion originating as a continuous integral extension of the lowermost accordian fold and containing two side borders and an outer border adapted to fold upwardly to form retaining walls which define a serving surface, said retaining walls being held upright by tab appendages of said borders adapted to fold onto and adhesively bond to the next contigu-

ous retaining wall, whereby said tray portion may be disposed at an essentially right angle with respect to said bib portion and



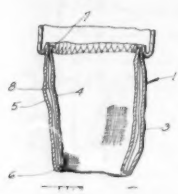
adjustably positionable in both vertical and horizontal directions.

4,114,200

LIQUID IMPERVIOUS CUFF FOR A DISPOSABLE SURGICAL GOWN AND METHOD OF ATTACHMENT OF THE CUFF THERETO

Linda Hebert Smith, Knoxville, and Robert C. Johnson, Memphis, both of Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Filed Jan. 17, 1977, Ser. No. 759,631
Int. Cl.[2] A41D *13/00*; A41B *7/12*
U.S. Cl. 2—51 **35 Claims**



17. A disposable surgical gown having a body-covering portion and sleeves, said body-covering portion and sleeves being made of a liquid strike-through resistant material, each of said sleeves terminating at its free end in a sleeve opening, a liquid impervious cuff assembly attached to each sleeve at said opening thereof, said cuff assembly comprising a cylinder of cloth-like material folded back upon itself to form a double-walled, substantially cylindrical cuff envelope folded at its forward end, open at its rearward end and having inner and outer cuff envelope walls, a layer of liquid impervious material located between said inner and outer cuff envelope walls and extending from said rearward end of said envelope toward said forward end, said inner and outer cuff envelope walls and said layer of liquid impervious material at said rearward end of said cuff envelope being attached to said surgical gown sleeve at said opening thereof.

4,114,201

VENTILATED HEAD COVER

Harold K. Garrison, 1010 Grove Blvd. Apt #105, Austin, Tex. 78741

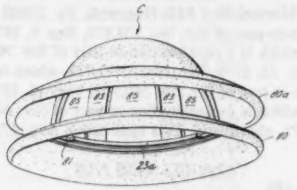
Filed May 12, 1977, Ser. No. 796,313
Int. Cl.[2] A42B *5/04*
U.S. Cl. 2—209.7 **8 Claims**

1. A ventilated head cover, comprising:

(a) a head cover having a crown portion for surrounding and covering a person's head;

(b) a plurality of ventilation openings in the sides and front and back of the crown to allow air to freely circulate around and across the head through such crown, such openings being positioned on opposite sides of the crown so as to provide a substantially straight through-flow path for the circulation of air into the crown from one side and out of the crown on the opposite side or from front to back; and

(c) sweatband means secured to the crown for positioning the head cover on a wearer's head, such sweatband means including a plurality of circumferentially spaced ventilation passages for permitting the flow of air between the wearer's head and the crown to further facilitate the flow of air up, into and out of the crown, wherein the crown is provided with a pair of outwardly and downwardly projecting bills positioned above and below the front opening for shading the opening and the face of the wearer, respectively.

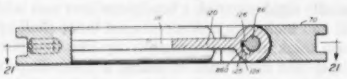


4,114,202

PROSTHETIC VALVE ASSEMBLY FOR USE IN CARDIOVASCULAR SURGERY

Henry A. Roy, 1817 Market St., Warren, Pa. 16365, and George J. D'Angelo, R.D. #1, Box 156, Fairview, Pa. 16415

Filed Jan. 28, 1977, Ser. No. 763,565
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **5 Claims**



1. A prosthetic valve structure for use in cardiovascular surgery, said valve structure comprising a ring body having a fluid passageway formed centrally therethrough, the outer peripheral surface of the ring body being formed with a groove extending therearound, means in the groove for attaching the ring body within a fluid conduit of a patient's body, inner parts of the ring body being removed to form spaced apart bearing portions, each of said bearing portions presenting converging sides which extend radially inwardly in intersecting relationship, portions of the ring body lying between the said bearing portions being recessed to form concaved bearing apertures, bearing pin elements fixed in the bearing portions and extending chordally through the bearing apertures, a plurality of triangular valve flaps, said triangular valve flaps having cylindrical hinge sections rotatably mounted in the concaved bearing apertures on the respective pin elements and being movable in response to flow of blood to open and close the said flood passageway of the ring body, and elongated key means formed on each of the bearing pin elements in radially inwardly extending relationship for limiting the arcs of rotation through which the cylindrical hinge sections may be moved.

4,114,203

WATER CLOSET TANK DRAIN VALVE

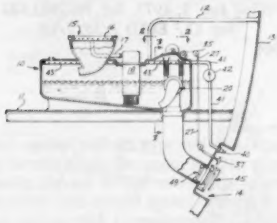
Raymond Jerome Carolan, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 22, 1977, Ser. No. 818,027
Int. Cl.[2] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—317 **6 Claims**

1. Waste Drain valve mechanism for a water closet waste

holding tank, comprising: an inverted U-shaped tubular member mounted within the tank and having one end affixed to and projecting out from the bottom of the tank, the other end being movable at the bend of the U-shape and having an intake nozzle opening; means for positioning said intake nozzle opening at the bottom of the tank for the operative waste removal position; apparatus under the control of an operator for removing waste under partial vacuum pressure through said intake nozzle opening; and means for positioning said intake nozzle opening to a raised position whereat the intake nozzle opening is at the top of the tank for preventing the removal of waste from the tank.

2. Waste drain valve mechanism for periodically draining the contents of a water closet waste holding tank, comprising:



an inverted U-shaped tube mounted within the tank and being separated at the bend thereof into a first and a second part; a movable juncture formed between said first and second parts at their bend separation, for relative movement therebetween; said first part being affixed to the tank with its non-joined end projecting out from the bottom of the tank and forming a tank drainage opening; said second part being movable with respect of said first part and having an intake nozzle opening at its non-joined end; and means for moving said second part from an operative waste removal position whereat the intake nozzle opening is adjacent to the bottom of the tank, to a raised position whereat the intake nozzle opening is at a closed abutment position at the top of the tank for preventing the removal of waste from the tank.

4,114,204

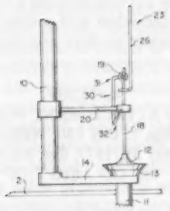
WATER-FLOW CONTROL DEVICE AND METHOD

James P. Blach, 1563 Begen Ave., Mountain View, Calif. 94040

Filed Jul. 7, 1977, Ser. No. 813,758

Int. Cl.[2] E03D *1/34*

U.S. Cl. 4—324 **9 Claims**



7. A water-flow control device for use in a toilet flushing apparatus using a valve member which is coupled to a lift wire having an upper free end with a lift wire eyelet formed therein, a lift wire guide for guiding the vertical travel of said lift wire and a flushing arm and handle assembly coupled thereto for lifting the valve member when the flushing arm and handle assembly is operated comprising:

a wire member having an L-shaped section for engaging said lift wire eyelet;

a *j*-shaped section for engaging said lift wire guide; and

a straight section between said L-shaped and said *j*-shaped sections which has a length which is proportional to the distance between said lift wire eyelet and the lower edge of said lift wire guide as measured when said valve member is in a closed position.

4,114,205

SAUNA

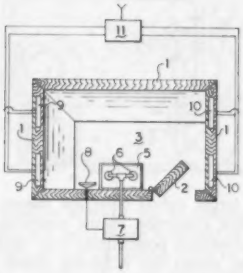
Gunter Müller, Bergstrasse 52, Bissendorf 2, Fed. Rep. of Germany (4501)

Filed Apr. 6, 1977, Ser. No. 785,269

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615294

Int. Cl.[2] A61H *33/06*

U.S. Cl. 4—160 **4 Claims**



1. A sauna comprising:

a wooden housing, having a floor, a ceiling, upstanding sidewalls joining said floor and ceiling, and a closable entryway;

a heating device disposed in said housing and including a temperature control element for regulating the heat emitted by said heating device at a temperature of approximately 35° C.,

a humidifier including at least one water jet nozzle, which is disposed above said heating device, to spray water in fine droplets above said heating device disposed in said housing and including a humidity control element for regulating the water vapor produced by said humidifier at an air moisture content of approximately 60 to 70 percent;

at least one pair of spaced-apart electrodes, disposed opposite one another in said housing, for creating an electric field within the inner space of said housing;

at least one irradiation lamp, disposed in said housing for creating light within the total visible spectrum of light, and UV and IR irradiation; and

a plurality of filters in all spectral colors, disposed adjacent said irradiation lamp, each of which comprises a glass or plastic disc bearing a different spectral color, said filters being slidably mounted on tracks so as to be displaceable in front of said irradiation lamp.

4,114,206

AUTOMATIC SWIMMING POOL CLEANING SYSTEM

Eugene K. Franc, P.O. Box 332, San Rafael, Calif. 94901

Filed Nov. 11, 1976, Ser. No. 740,910

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172 **8 Claims**

1. In a pool cleaning system,

a pool structure having an inner surface,

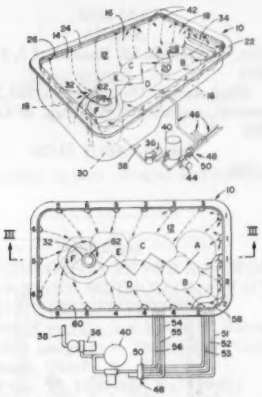
a plurality of jet means on said inner surface disposed for directing fluid to said inner surface thereby moving any debris and sediment,

a source of fluid under pressure, and,

control system means for directing fluid from said source of fluid under pressure selectively to alternate ones of said

plurality of jet means so as to sweep said debris and sediment toward and into said drain opening under the action of said plurality of jet means, further including

larger debris collection means for preventing larger debris such as leaves from entering said drain opening, said larger debris collection means permitting periodic re-

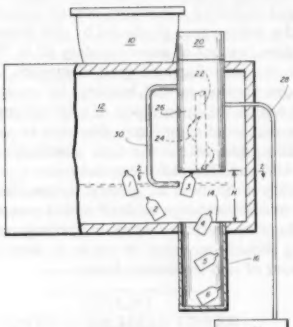


moval of larger debris collected therein, wherein said larger debris collection means comprises a selectively closeable container positionable over said drain opening and having means for receiving debris and returning larger debris therein while allowing smaller debris and sediment to pass therethrough.

4,114,207
TOILET

Robert C. Iwans, Farmington, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jul. 18, 1977, Ser. No. 816,585
Int. Cl.[2] E03D *9/10*; B01D *21/00*
U.S. Cl. 4—319 2 Claims



1. A toilet system comprising

a collecting tank,

a pump extending downwardly into the collecting tank and having an inlet of sufficient size to permit entry of bottles thereinto,

a continuously open opening in the bottom surface of said collecting tank directly beneath said pump inlet and having a size sufficient to receive large glass objects therein, the pump and bottom surface being sufficiently spaced to permit passage of bottles between the pump and bottom surface of the collecting tank,

a normally closed drain conduit extending downwardly from said opening,

said pump including discharge and recirculating conduits,

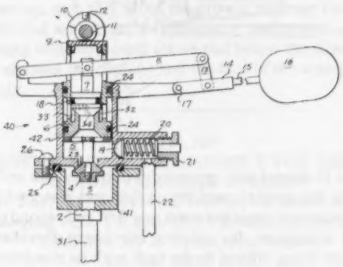
said pump conjointly delivering pressurized liquid to said drain and recirculating conduits,

said recirculating conduit being selectively positioned and having a selected size for discharging pumped liquid across the pump inlet whereby bottles which are being drawn upwardly into the pump opening will be deflected downwardly through said drain opening into said drain conduit.

4,114,208
WATER CLOSET FLUSH VALVE

Carl E. Imler, 213 W. Kirwin, Salina, Kans. 67401

Filed Jun. 1, 1977, Ser. No. 802,432
Int. Cl.[2] E03D *1/36, 1/06*
U.S. Cl. 4—366 7 Claims



1. A ballcock flush valve comprising a water inlet connected to a lower housing provided with an outlet, and sealing means to close said outlet, an upper body portion communicating with said outlet having a piston means slidably disposed therein which rests on said sealing means, means on said piston disposed at an extremity remote from said sealing means to provide downward displacement of said piston and therefore said sealing means, valve stem means sequentially disposed on said piston means and displaceable in the same sense as said piston means, means connected to said valve stem means remote from said piston means to provide displacement of said valve stem means relative to said piston means, passage means disposed between said piston means and said valve stem means to provide a fluid passage when said piston means or said valve stem means moves relative to each other, syphon tube means communicating with said fluid passage to carry away the fluid which passes therethrough, and plunger means communicating with said upper body portion through a channel which serves to fill a tank reservoir when said sealing means is displaced allowing incoming water to enter into said upper portion.

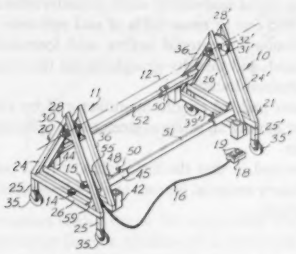
4,114,209
TILTING ATTACHMENT FOR A BED

Joseph P. Sandlin, Rte. 1, Box 550, Williston, Fla. 32696

Filed May 31, 1977, Ser. No. 801,475
Int. Cl.[2] A61G *7/06*
U.S. Cl. 5—62 6 Claims

1. An attachment, for a bed having feet to support said bed and a mattress for supporting a person on said bed, said attachment including a base frame, said base frame comprising a pair of spaced stanchions, and a pair of journal means carried by said stanchions, a receiving frame carried by said base frame for receiving said bed, said receiving frame comprising a first stirrup having a base, an apex above said base and generally centrally thereof, said first stirrup being adjacent to one stanchion of said pair of stanchions, a first axle fixed to said apex and extending towards said one stanchion, said axle being journaled in one of said journal means, a second stirrup having

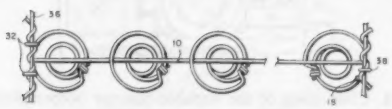
a second base, a second apex above said second base and generally centrally thereof, said second stirrup being adjacent to the other stanchion of said pair of stanchions, a second axle fixed to said second apex and extending towards said other stanchion, said second axle being journaled in the other of said journal means, a plurality of securing means carried by said first base and said second base for holding said feet of said bed above a support surface, said first axle and said second axle being located along and coaxial with an axis, said axis being located so as to extend generally along the upper surface of said mattress and longitudinally thereof so that said axis is generally coincident with the center line of said person, means for selectively fixing said first stirrup with respect to said second stirrup for simultaneous movement, and tilt control means for rotating said receiving frame with respect to said base frame about said axis.



4,114,210
SPRING ASSEMBLY WITH REINFORCEMENT

Alexander M. Levine, Boston, and Henry R. Ramsey, Dudley, both of Mass., assignors to Webster Spring Co. Inc., Oxford, Mass.

Filed Jun. 10, 1977, Ser. No. 805,513
Int. Cl.[2] A47C *23/04*
U.S. Cl. 5—260 **1 Claim**

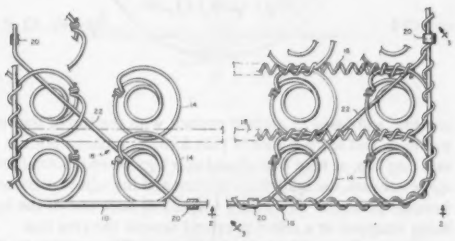


1. In a spring assembly including upper and lower border wires of rectangular configuration and a plurality of longitudinally-spaced, transversely-extending rows of coils, said coils being connected at their upper and lower ends to the border wires and to each other; pairs of elongate stiffening elements disposed transversely of the assembly along the top and bottom ends of the coils in a row of coils, said stiffening elements each comprising an inextensible wire strand of such stiffness as to afford appreciable resistance to bending, a hook at one end and means at the other end resistant to compression in a plane perpendicular to the strand, said hook comprising a first part at right angles to the strand and a second part at right angles to the first part, parallel to the strand extending toward the opposite end and said means resistant to compression comprising a loop at said end, the plane of which is perpendicular to the strand, said loop comprising a top part parallel to the first part at the opposite end of the strand, a bottom part spaced from and parallel thereto and spaced V-shaped side parts, each comprising a single loop of wire at the apex and a pair of sloping arms connected to the top and bottom parts, said V-shaped side parts being disposed with their arms sloping toward each other and with the loops situated midway between the top and bottom parts and laterally of the ends of the top and bottom parts, said elements being comprised of a single length of wire and being adapted to be applied one at the top side and the other at the bottom side of the assembly from opposite sides thereof by weaving of the strands alternately above and below the upper and lower ends of the coils and to be anchored at the opposite ends by clamp rings which clamp, respectively, the hooks at one end to the border wires and the loops at the other ends to the border wires.

4,114,211
CORNER STIFFENER

Alexander M. Levine, Boston; Henry R. Ramsey, and Robert T. Martin, both of Dudley, all of Mass., assignors to Webster Spring Co. Inc., Oxford, Mass.

Filed May 6, 1977, Ser. No. 794,355
Int. Cl.[2] A47C *23/053*
U.S. Cl. 5—261 **3 Claims**



1. A corner stiffener element for an innerspring mattress assembly, wherein coil springs are arranged in a rectangular pattern in longitudinal and transverse rows so that their end coils collectively define spaced, parallel supporting surfaces and wherein there is a border wire frame having horizontal edge and end portions extending along the outer edges of the end coils of the coil springs; one at each of the corners of the assembly in longitudinal and transverse spaced relation so that each is effective independently of every other within the locale of the corner within which it is associated, each element comprising spaced, parallel wires resistant to extension, the distance between which is substantially the distance between the border wires of the assembly, attaching portions at each end of the wires bent at an angle thereto such that an extension of the bent ends would intersect at right angles and compression-resistant means situated between the bent ends and connecting said bent ends which resist displacement of the parallel wires toward each other, comprising coil spring means situated between the bent ends in the planes of the bent ends.

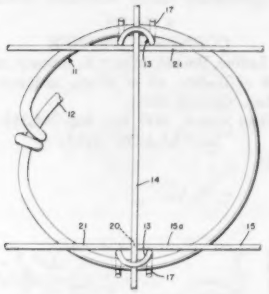
4,114,212
BED SPRING UNIT AND METHOD

Edwin G. Krakauer, Roslyn Heights, N.Y., assignor to Kay Manufacturing Corp., Syosset, N.Y.

Filed Feb. 22, 1977, Ser. No. 771,038
Int. Cl.[2] E04C *02/42*; A47C *23/04*
U.S. Cl. 5—267 **16 Claims**

1. In a bed spring unit, the assembly of a wire grid, a multiplicity of spring coils each terminating in a top ring having a circumferential perimeter and wire means connecting the grid to two opposite points of each ring, said grid comprising two sets of substantially straight wires, one set of said substantially straight wires consisting of a plurality of spaced substantially parallel upper first wires, the other set of said substantially straight wires being second wires substantially parallel to each other and substantially perpendicular to the said first wires and welded to the under sides of the said first wires at the intersections of the said respective first and second wires, said wire means having a first wire and two second wires connected together within the circumferential perimeter of each top ring and resisting movement of the said top ring relatively to the said wire grid, said wire means having a wire clip arranged at each of two diametrically opposite points of said top ring, each

said wire clip having two spaced apart legs joined integrally at the respective upper ends thereof by an arcuate portion, each of said first wires of the assembly crossing a top ring at two diametrically opposite points thereon and being in pressed contact with the top of the ring, two of said second wires also



crossing and being in pressed contact with the top of the ring and each said second wire in part forming a chord portion of said ring top, at least one of said clip legs passing through the space between the said chord portion and the adjacent circumferential perimeter of the ring top and at least one of the legs being wrapped to a selected extend around the ring top.

4,114,213

METHOD FOR MANUFACTURING ESSENTIALLY WRINKLE-FREE FOAMED ARTICLES WITH AN UPHOLSTERY MATERIAL ADHERING THERETO AND RESULTANT ARTICLE

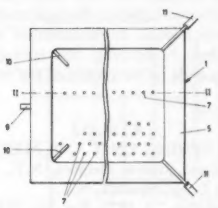
Andre M. H. J. Beernaerts, Gembloux, Belgium, and Hendrik J. K. Eskes, Apeldoorn, Netherlands, assignors to International B. F. Goodrich-Europe B.V., The Hague, Netherlands

Filed Jul. 28, 1975, Ser. No. 599,480

The portion of the term of this patent subsequent to Jun. 19, 1995, has been disclaimed.

Int. Cl.[2] A47C *7/18;* B29D *27/04*

U.S. Cl. 5—345 R **9 Claims**



1. In a method of manufacturing foam-padded upholstered articles with an integral stretchable upholstery material adhering to the foam, in a female mold part and an opposing part, in which said female mold part is divided by separating wall means into a cavity in the shape of the article and into a vacuum chamber, said cavity and said chamber in communication with each other by holes in said separating wall means, said opposing part forming a closure of said femal mold part, comprising the steps of

positioning a sheet of stretchable upholstery material in the cavity of said female mold part with the ends of said upholstery material resting on the outer edge of said female mold part;

exhausting said vacuum chamber to form at least a partial vacuum therein and produce sliding of the upholstery material on said outer edge toward the periphery of said mold cavity and into engagement with said separating wall means in said cavity whereby wrinkles may be formed in undesired locations in said upholstery material;

introducing a foamable material into said cavity;

foaming said foamable material;

and taking the finished product out of the mold;

and the improvement which comprises the step of

forming one or more folds in said upholstery material in one or more predetermined locations by pressing inwardly on siad upholstery material into said cavity with a plate in said cavity at said one or more predetermined locations to form said one or more folds of said upholstery material in said foamable material before said foamable material is hardened, and thereby straighten out the wrinkles formed in undesired locations.

7. A foam padded article manufactured by the method of claim 1 and having an integral stretchable upholstery adhering to the foam

characterized in that the article has at least one fold in the upholstery material formed at a predetermined location on the article.

4,114,214

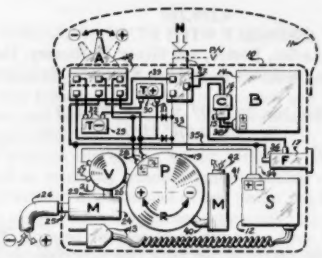
SUPER-CONFORMING SEATING SYSTEM

Robert VonHeck, 3910 Hicock St., San Diego, Calif. 92110

Filed Jun. 21, 1976, Ser. No. 698,719

Int. Cl.[2] A47C *27/00*

U.S. Cl. 5—367 **10 Claims**



1. Cushioning of the variable-contour body-molding type comprising a resilient imperforate casement containing a myraid quantity of deformable micro-bearings, as characterized in the following improved conditions of operation

(A.) floative-mode, an expansive state created by selective means inducing a positive fluidic pressure-differential serving to bouyantly counterpoise occupant thereupon, enhancing subsequent conformability by eliminating excessive micro-bearing frictional resistance to an otherwise propensity toward flowing to points of least bodily resistance, preparing an advanced state of conformability heretofore unknown;

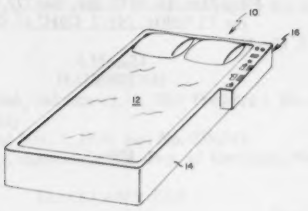
(B.) neutral-mode, a semi-formable state created by selective means inducing ambient fluidic pressure to neutralize either differential effect, wherein a substantially spherical micro-bearing shape is represent but achieving a retarded rolling propensity due to friction impossed by weight of occupant thereupon, thereby exhibiting mild compliance as an interim mode of operation;

(C.) conform-mode, a compressive state created by selective means inducing a negative fluidic pressure-differential serving to impose a substantially polyhedral micro-bearing shape, resulting in high frictional interlocking of micro-bearing surfaces which en masse resist further cushion surface change, hence, fixing an instant body mold of the occupant.

4,114,215
UNITARY ACCESSORY CONTROL FOR A WATERBED

Philip J. Santo, 130 Larkspur La., Rochester, N.Y. 14622

Filed Jul. 11, 1977, Ser. No. 814,205
Int. Cl.[2] A47C *21/08, 27/08*
U.S. Cl. 5—370 7 Claims

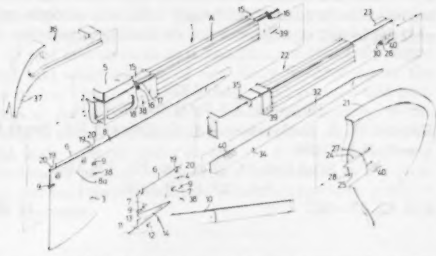


1. In combination with a frame for supporting the perimeter of a fluid containing flexible bladder of a waterbed, a unitary accessory control comprising: a housing attached to said frame, a series of chambers in said housing, first accessory means located in a first of said series of chambers for producing sound, second accessory means located in a second of said series of chambers for regulating the environment surrounding said waterbed, third accessory means located in a third of said series of chambers for regulating the physical properties of said waterbed, and control means accessible from the exterior of said housing for controlling said first, second and third accessory means.

4,114,216
COMBINATION TOOL

Sven-Olof Gatby, Strandgatan 3, 794 00 Orsa, Sweden

Filed Feb. 9, 1977, Ser. No. 767,194
Claims priority, application Sweden, Feb. 10, 1976, 7601403
Int. Cl.[2] B25F *1/04*
U.S. Cl. 7—116 6 Claims



1. In a combination tool comprising an elongated tubular handle, and a plurality of tool members each adapted to be inserted into at least one end of said handle, a locking means for releasably connecting said tool members to said handle comprising:

two opposite slots at at least one end of said handle;

a support block fixed to the outer surface of said handle and covering one of said slots;

stop means fixed to at least one side of each tool member for engagement with the inner surface of the handle opposite to the slot covered by the support block;

a leaf spring fixed to the outer surface of the handle;

a transverse locking pin fixed to at least one end of said leaf spring and mounted for movement in a direction parallel to its axis;

at least one transverse aperture in said handle for receiving said locking pin which is resiliently biased by said leaf spring into said transverse aperture;

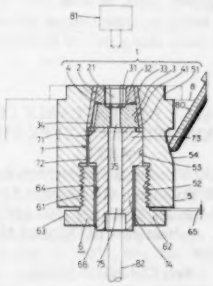
and at least one groove in the back edge of said tool member, said groove having a shape complementary to that of the locking pin;

whereby said locking pin engages the groove in the tool member thereby to securely lock the tool member to said handle.

4,114,217
DIE ASSEMBLY

Motoji Akamatsu, Hirakata, Japan, assignor to Akamatsu Alloy Tool Co., Ltd., Hirakata, Japan

Filed Sep. 19, 1977, Ser. No. 834,387
Claims priority, application Japan, Sep. 21, 1976, 51-128120[U]
Int. Cl.[2] B21J *13/02*
U.S. Cl. 10—85 4 Claims



1. In a die assembly including a reinforcement case, an upwardly tapered forming die fitting in said case, and a pushing-up member screwed into the lower portion of said reinforcement case to push up said forming die into intimate fitting contact with said reinforcement case, the improvement comprising said pushing-up member threaded into a threaded bore in the lower portion of said reinforcement case and having a center bore extending therethrough, a stock die provided between said forming die and said pushing-up member and having a center bore extending therethrough, a stock die provided between said forming die and said pushing-up member and having an upper surface supporting said forming die in contact with its bottom, said stock die having at its lower portion a guide stem of smaller diameter than said center bore freely movably fitting in the center bore of said pushing-up member, said pushing-up member supporting said stock die and pressing said stock die into intimate fitting contact with said forming die by screw-thread engagement with said reinforcement case.

4,114,218
METHOD OF FORMING FLAT FOUR-SIDED FASTENER PARTS HAVING AN OPENING THEREIN

Larry Stuart Pendell, Rte. 8, Box 489, Elkhart, Ind. 46514

Filed May 23, 1977, Ser. No. 799,705
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] B21D *53/20, 53/24*
U.S. Cl. 10—86 R 4 Claims

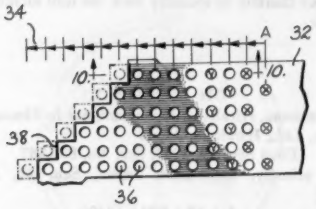
1. A method of forming flat, square-shaped individual fastener parts each having an opening therein from an elongated strip of sheet material having a width exceeding the width of each such fastener, comprising the steps of:

(a) causing said material to pass progressively through a work station;

(b) first forming a series of longitudinally spaced openings in

the material as it passes through said work station; and then

(c) periodically severing said material as the material passes through the work station from one side edge to the other side edge of the material in one cutting operation along an



irregular cutting line defining contiguous multiple sides of adjacent fastener parts to separate individual fastener parts from said adjacent parts, at least one of said individual fastener parts being separated along said cutting line from such adjacent parts along two of its adjoining sides.

4,114,219

LONGITUDINALLY DISPLACEABLE CONNECTION FOR CANTILEVERED BEAM-TYPE STRUCTURAL PARTS

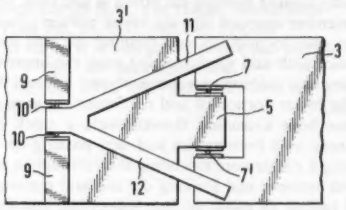
Herbert Schambeck, Frieding b. Herrsching, Germany, assignor to Dyckerhoff & Widmann AG, Munich, Germany

Filed Jul. 20, 1977, Ser. No. 817,504

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633668

Int. Cl.[2] E01D *19/06*

U.S. Cl. 14—16.1 **9 Claims**



1. A longitudinally displaceable connection comprising a pair of generally horizontally arranged longitudinally extending cantilevered beam-type structural members with structural members disposed in longitudinal alignment and each having a cantilevered end with said cantilevered ends disposed in juxtaposed relation, a horizontally arranged projecting part secured to and extending outwardly from the cantilevered end of one of said structural members into the cantilevered end of the other one of said structural members, a first horizontally displaceable bearing in the cantilevered end of the other one of said structural members and said first bearing supporting said projecting parts, said projecting part and said first bearing arranged for the transmission of shear forces, wherein the improvement comprises a reinforcing part separate from said projecting part and rigidly connected to one of said structural members and extending outwardly in the longitudinal direction thereof from the cantilevered end thereof into the cantilevered end of the other one of said structural members, and at least one second horizontally displaceable bearing separate from said projecting part and said first bearing and said second bearing located in the other one of said structural members into which said reinforcing part extends and affording a bearing support for said reinforcing part spaced longitudinally from said first bearing and said second bearing being suitable for the transmission of shearing forces.

4,114,220

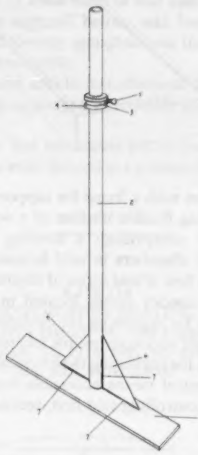
COMBINATION LEVELING AND GRADE CHECKING TOOL

Barry Lee Pfister, 2259 Ellington, Walled Lake, Mich. 48088

Filed Mar. 14, 1977, Ser. No. 777,340

Int. Cl.[2] E01C *19/12;* **G01C** *15/06*

U.S. Cl. 15—105 **6 Claims**



1. A hand tool for raking and leveling concrete and for establishing a grade level comprising: a base plate; a handle mounted substantially perpendicular and centrally on said base plate and fixed thereto for performing the raking and leveling function; a sight collar slidably mounted on said handle and having a sight portion to provide for an accurate alignment of grade level from a remote sighting device, said sight portion comprising a sight groove circumferentially extending about said collar and located substantially equidistant between the top and bottom edges of said sight collar and a bright colored material in said sight groove for facilitating alignment.

4,114,221

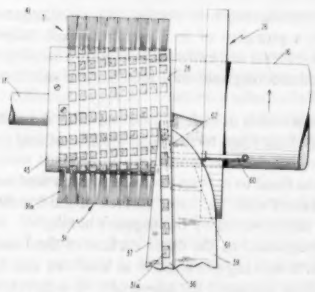
HELICALLY WOUND BRUSH

Harvard W. K. Enchelmaier, 4 E. Greenbrook Rd., North Caldwell, N.J. 07006

Filed Sep. 17, 1976, Ser. No. 724,410

Int. Cl.[2] A46B *3/08*

U.S. Cl. 15—182 **10 Claims**



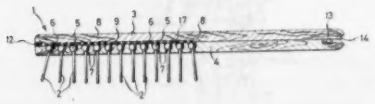
1. In a wound brush having bristle tufts bound to a brush

core by a helically wound strip having longitudinally spaced edge notches therein, the bristle tufts projecting through the notches in the strip, the roots of the bristles and the strip being bonded to the brush core by a cured adhesive, the improved bristle binding strip having an edge notched main part which lies in a helix spaced from and concentric with the brush core, and a plurality of strip spacing and supporting tabs integral with the main part of the strip and extending radially inwardly therefrom, the inner free ends of the tabs engaging the core.

4,114,222
HAIRBRUSH

Vladislaus Serediuk, Schusterstr. 1, 7800 Freiburg i. Br., Fed. Rep. of Germany

Filed Nov. 5, 1976, Ser. No. 739,341
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550265
Int. Cl.[2] A46B *9/08*
U.S. Cl. 15—186 **28 Claims**



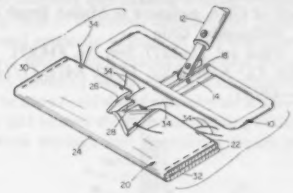
1. A hairbrush, comprising a substantially rigid body member having an inner hollow and a plurality of apertures communicating with said inner hollow; a plurality of substantially rigid elongated pins each extending through one of said apertures and mounted in said body member, each of said pins having a shaft part and a head part; and mounting means for mounting said pins in said body member including a front portion formed in each of said apertures adjacent to and open at an outer surface of said body member and dimensioned to receive said shaft portion of a respective one of said pins with radial play, an enlarged rear portion formed in each of said apertures and open at an inner surface of said body member facing toward said hollow and dimensioned to completely receive said head part of a respective one of said pins with clearance, and an elastic insert located in said hollow of said body member and adjacent to said enlarged rear portions of said apertures so as to abut against said head parts of said pins when said head parts are received in said enlarged rear portions of said apertures, so that said pins are elastically urged toward said outer surface of said body member under the action of said elastic insert upon said head parts of said pins, whereas at the same time said pins can be displaced in the direction of elongation thereof through said apertures relative to said body member and can also be pivoted, while being simultaneously guided during their displacement by the location of said head parts of said pins in said enlarged rear portions of said apertures.

4,114,223
MOP HAVING A REMOVABLE COVER

Ritchie Buchanan, P.O. Box 221, Seabrook, N.H. 03874

Filed May 9, 1977, Ser. No. 795,191
Int. Cl.[2] A47L *13/24*
U.S. Cl. 15—228 **2 Claims**

2. A mop cover adapted for removable mounting on a frame having a handle pivotally mounted centrally thereof and adapted for movement from one side to the other side of said frame, said cover comprising a generally rectangular envelope having cleaning surfaces on both sides thereof, said cover open along one edge to permit insertion of said frame therein, said cover surfaces joined on the edge opposite said one edge and comprising an integral fold of cover material, said cover surfaces permanently secured together at their side edges extending between said fold and said one edge, said cover surfaces each provided with a slot extending centrally therefrom to said cover one edge to permit said mop handle to extend through said slots when said handle is rotated from one side of said

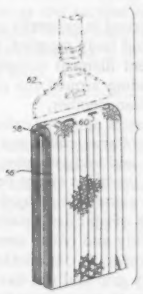


frame to the other side thereof; and closure means provided at said one edge adjacent said slots for closing said cover about said frame.

4,114,224
MOP COMPRISING BONDED NONWOVEN FABRIC ABSORPTIVE ELEMENTS

Eberhard Disko, Munich, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Filed Jan. 17, 1977, Ser. No. 760,209
Claims priority, application Spain, Apr. 13, 1976, 14166; Apr. 13, 1976, 220296[U]; Apr. 13, 1976, 220294[U]; Apr. 13, 1976, 220295[U]; Fed. Rep. of Germany, Aug. 12, 1976, 7625260
Int. Cl.[2] A47L *13/20*
U.S. Cl. 15—229 A **2 Claims**

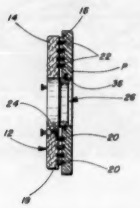


1. In a mop comprising a plurality of absorptive elements, a handle and means joining said elements to said handle, the improvement wherein said absorptive elements comprise a plurality of superposed flat layers of bonded non-woven fabric of about 1 to 2mm thickness and said non-woven fabric comprises a fibrous web and a binder, the fibrous web comprising at least about 50% by weight of hydrophilic fibers, the binder being present in about 25 to 100% by weight of the fibers, in about 50 to 400 grams per square meter, being printed onto said fabric in a pattern and being present in greater amount adjacent the surfaces than in the interior of said fabric, the layers being joined along a medial spine along which they are adapted to be commonly joined to the handle, the layers each being slit from said spine in both directions to the extremities thereof to form parallel flat strips ranging in width from about 15 to 40mm and in length from about 20 to 60 cm.

4,114,225
BRUSH-LIKE MOUNTING DEVICE

Terrance J. Malish, Willoughby Hills, and Martin J. Hulin, Euclid, both of Ohio, assignors to Malish Brush & Specialty Company, Willoughby, Ohio

Filed Jul. 11, 1977, Ser. No. 814,491
Int. Cl.[2] A46B *9/02, 13/02;* A47L *11/14*
U.S. Cl. 15—230.17 7 Claims



1. A mounting device detachably mounting a fiber pad-like element having a central bore for assembly with a machine, such as for use in cleaning, stripping, scrubbing, polishing or the like, and of the type for rotating the mounting device about a vertical axis and in a generally horizontal plane substantially parallel to the work surface, said mounting device comprising,
- a generally circular body member of substantially flat construction defining an outer endless peripheral edge,
- said body member having a centrally disposed bore adapted to receive a drive spindle for detachable connection to said machine,
- first retention means including a multiplicity of resilient filament elements extending outwardly from one face of said body member adapted for supporting and mechanically gripping the fibrous material of said pad-like element,
- said filament elements being made of a high-strength polymeric material and disposed in a generally concentric circle with respect to the bore in said body member,
- second retention means including an annular collar member attached to said body member on the side remote from said machine,
- said collar member disposed in generally concentric relation around the bore in said body member, and
- a multiplicity of resilient filament elements made of polymeric material extending around the periphery and outwardly from said collar member,
- said last mentioned filament elements extending generally at right angles to said collar member and being spaced axially outwardly from said body member, the filament elements of said second retention means being disposed so as to be generally in the plane defined by the terminal ends of the filament elements of said first retention means, and
- the filaments in said body and collar members being angularly disposed with respect to one another so as to frictionally and mechanically grip said pad-like element on angularly disposed surfaces to prevent rotational and/or lateral shifting movement of the same relative to said body member during operation of said machine.

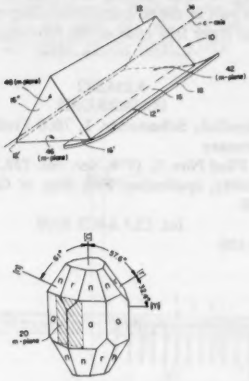
4,114,226
WEAR RESISTANT ALPHA ALUMINA ARTICLE USEFUL TO CLEAN MAGNETIC TAPE AND THE PROCESS OF PRODUCING SAID

Peter Carter Warren, El Cajon, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 1, 1977, Ser. No. 773,223
Int. Cl.[2] B28D *5/00*
U.S. Cl. 15—236 R 3 Claims

1. As an article of manufacture for use as a wearing edge in the cleaning of magnetic tape and similar applications, a body formed of unicrystalline alpha alumina having a wearing edge substantially parallel to the C-axis of the unicrystalline alpha alumina body and having ground and polished planar surfaces intersecting at said wearing edge, each of said planar surfaces being aligned with an m-plane of said unicrystalline alpha alumina body.

3. A method for making a wearing edge on a body of unicrystalline alpha alumina which comprises (i) providing a rod of unicrystalline alpha alumina having its longitudinal axis

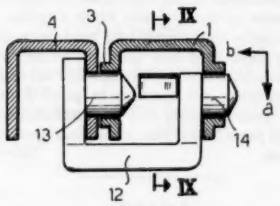


parallel to the C-axis of said unicrystalline alpha alumina (ii) mounting said rod length-wise on a grinding plate (iii) grinding a first length-wise portion of said rod to provide a first planar surface therein parallel to an m-plane of said rod (iv) grinding a second length-wise portion of said rod to provide a second planar surface which intersects said first planar surface at an angle of 60°.

4,114,227
CONNECTION BETWEEN A WINDSHIELD WIPER BLADE AND THE OSCILLATING ARM CARRYING IT

Ronald Blackman, Druento (Turin), Italy, assignor to Arman S.p.A., Druento (Turin), Italy

Filed Jun. 6, 1977, Ser. No. 803,502
Claims priority, application Italy, Jun. 8, 1976, 68385 A/76
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 8 Claims

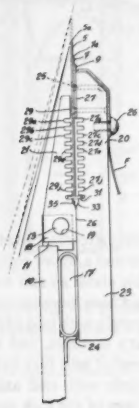


1. A windshield wiper assembly comprising:
(a) an oscillatable arm terminating at one end in a head having two spaced apart and axially aligned hollow cylindrical seats,
(b) a wiper blade having a main elongated rod,
(c) a U-shaped bracket fixed to said main rod and projecting laterally therefrom in a direction parallel to the windshield,
(d) means carried by said bracket for engaging said seats to pivotally join said oscillatable arm and said wiper blade, and
(e) means for limiting relative lateral movement between said assembled arm head and bracket to prevent accidental separation of said head and bracket.

4,114,228
CREPING DOCTOR DEVICE

Jack Frederick Brown, Pierrefonds, Canada, assignor to James Ross Limited, Lachine, Canada

Continuation-in-part of Ser. No. 614,831, Sep. 18, 1975, abandoned. This application Jun. 8, 1976, Ser. No. 693,831
The portion of the term of this patent subsequent to Jan. 14, 1992, has been disclaimed.
Int. Cl.[2] D21G *3/00*
U.S. Cl. 15—256.51 **15 Claims**



1. A pressure finger for a doctor blade pressure blade assembly, comprising:

a bearing part permitting the finger to be pivotably mounted;

first and second jaws extending forwardly of the bearing part, each jaw comprising an inner surface, the inner surface of said first jaw being spaced from but facing the inner surface of said second jaw, the surfaces defining therebetween a mounting slot for receiving the doctor blade;

wherein said inner surfaces have mounting means for adjustably mounting a doctor blade stop extending across said mounting slot, said mounting means including each said inner surfaces having a plurality of transverse parallel grooves spacing longitudinally of said mounting slot;

respective ones of said grooves in one of said surfaces being aligned transversely of said mounting slot with respective ones of said grooves in the other one of said surfaces;

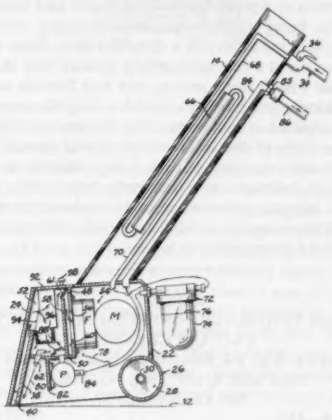
and further comprising a tongue extending rearwardly of said bearing part and in a direction opposite to the direction of said jaws, said tongue comprising a bearing surface contacting a pressure means acting to urge the finger, about the bearing part, in a doctoring direction.

4,114,229
SURFACE CLEANING APPARATUS

Terry H. Jones, Norman, Okla., and John J. Oakes, Garland, Tex., assignors to Clarke-Gravely Corporation, Muskegon, Mich.

Continuation of Ser. No. 158,357, Jun. 30, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,623
Int. Cl.[2] A47L *5/34*
U.S. Cl. 15—320 **12 Claims**

1. A portable apparatus for cleaning a floor surface, comprising: a downwardly open rectangular housing having a forward wall and a rearward wall; upwardly and rearwardly directed handle means connected with said housing; a first partition transversely dividing said housing and forming a suction nozzle in cooperation with said forward wall; a second partition transversely dividing said housing and forming a used cleaning fluid receiving chamber communicating with said suction nozzle; said second partition including an aperture therethrough; blower means mounted within said housing generally behind said second partition and generally adjacent said aperture and communicating with said aperture for rapid air evacuation of said chamber and causing a large volume of air and used cleaing fluid to be drawn through said suction nozzle; a shield disposed generally in front of said aperture within said chamber, said shield being spaced from said second partition and generally covering said aperture; said shield including an opening at the top of said shield whereby air is drawn from said chamber by said blower through the opening at the top of said shield and then through said aperture; a liquid pump within

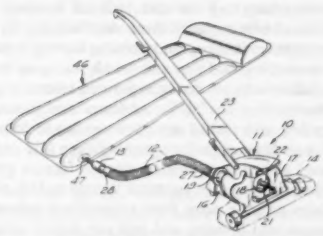


said housing and having an intake port communicating with said chamber for evacuating used cleaning fluid, said liquid pump having an outlet port; elongated discharge tubing connected, at one end, with said outlet port and communicating, at its other end, with a remote source of disposal; sprayer means supported within said housing for spraying a cleaning fluid on a portion of a floor surface to be cleaned adjacent and ahead of said suction nozzle as the suction nozzle is moved across a floor; elongated supply tubing connected, at one end, with said spraying means and connected, at its other end, with a remote constant source of fluid.

4,114,230
DEFLATOR-INFLATOR ATTACHMENT

Charles H. MacFarland, Rocky River, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 20, 1976, Ser. No. 752,399
Int. Cl.[2] A47L *5/14*
U.S. Cl. 15—330 **8 Claims**



1. An assembly for inflating and deflating objects comprising a residential type vacuum cleaner power plant, including a motor, a housing having an air inlet and an air outlet, a fan in the housing driven by the motor, a flexible air hose, coupling means on one end of the hose to alternately connect the hose to the air outlet or the air inlet, the other end of the hose having

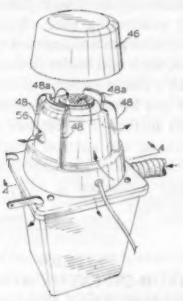
a substantially circular cross section, a nozzle adapted to be releasably connected to the circular other end of the hose, said nozzle having a hose end engaging portion of a diameter generally equal to the diameter of the other hose end, a forward end of said nozzle including a circular tip portion of a diameter substantially reduced from the diameter of the hose engaging portion, said nozzle having a transition portion intermediate said hose engaging portion and said tip portion, said transition portion including first and second frustum sections, said first frustum section being adjacent said circular tip portion and flaring radially outwardly in a direction away from said circular tip portion at a relatively shallow angle, said second frustum section being adjacent said hose engaging portion and flaring radially outwardly in a direction away from said first frustum section at a rate substantially greater than the rate of flare of said first frustum secton, said first frustum section of said transition portion being adapted to seal the mouth of an inflation valve when said circular tip portion is fully inserted within the body of the inflation valve, said second frustum section of said transition portion being adapted to seal the mouth of an inflation valve relatively larger than said first mentioned inflation valve when said circular tip portion and said first frustum section are fully inserted within the body of said relatively larger inflation valve.

4,114,231

MOTOR VENTILATION SYSTEM FOR WET/DRY VACUUM CLEANER

Jelle G. Nauta, R.R. #4, Stouffville, Ontario, Canada

Filed Mar. 4, 1977, Ser. No. 774,317
Int. Cl.[2] A47L *5/00*
U.S. Cl. 15—413 **4 Claims**



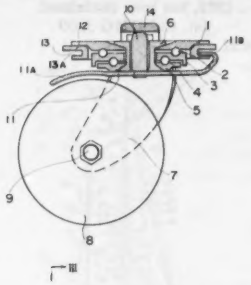
1. A housing assembly for a vacuum cleaner motor-vacuum pump assembly comprising a substantially bulbous housing containing said motor-vacuum pump assembly, said housing assembly having a series of inlet ports in the top surface thereof, a matching cap for said bulbous housing, said cap fitting over and being spaced from said housing by a ribbed structure assembly, said cap and housing having a plurality of openings formed by said cap and said housing at the base of said cap, said openings forming separated inlet and discharge openings for cooling air for the motor of said motor-vacuum pump assembly, said ribbed structure serving to form air flow passages for air flowing in the space between said cap and said housing, said ribbed structure serving to form a plurality of isolated inlet and discharge passages therein so that air flowing into any inlet passage must flow upwardly a substantial distance between said housing and said cap before entering said housing through said inlet ports, said motor-vacuum pump assembly having a fan for moving cooling air through said motor and housing, said air passing through the motor of said motor-vacuum pump assembly to remove heat therefrom, said cooling air passing from said motor into a discharge passage in the space between said cap and said housing and thence to atmosphere through said discharge openings.

4,114,232

CASTER WITH BRAKING MECHANISM

Katsuhiko Umeda, Kodaira, Japan, assignor to Shin Nihon Koku Seibi K.K., Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,817
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—35 R **7 Claims**



1. A caster comprising a rotary thrust bearing provided with an upper base member and a lower rotary member, said rotary member being rotatable about an axis with respect to the upper member, means on said base member providing a nonrotatable annular surface concentric with said axis, a two-leg fork rigidly attached to said rotary member, and a wheel rotatable supported at the lower end of said fork between the legs thereof, a vertical pin concentric with said axis, a brake member extending between the legs of the fork under said pin and above said wheel, said brake member having one end portion movable from a retracted position to an engaged position in frictional contact with the wheel, said brake member having another end portion movable from a retracted position into an engaged position in contact with said annualr surface, and a lever arm pivotally supported on the base and havng an outer end extending outwardly beyond the base and an inner end located directly above the pin, said lever arm being movable to depress said pin whereby said pin moves said brake member to shift said end portions to said engaged positions.

4,114,233

WINDOW TRIM ASSEMBLY

Gerald A. Hamilton, Skillman, N.J., assignor to Val-Trac Incorporated, New York, N.Y.

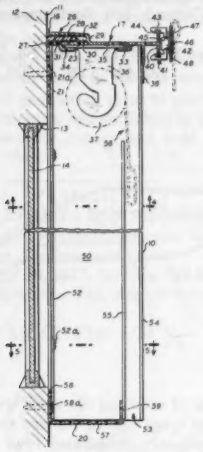
Continuation-in-part of Ser. No. 730,411, Oct. 7, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,236
Int. Cl.[2] A47H *1/04*
U.S. Cl. 16—95 R **19 Claims**

1. Window head trim assembly comprising a mounting base member and a front head trim member attachable thereto, said mounting base member having a base portion positionable vertically for mounting against a window frame head or wall, said front head trim member having a generally flat main body panel portion positioned, when attached, in a horizontal plane and adapted to support at least one of valance, shade or curtain mounting elements, and means for attaching the trim member to the base member, with its base portion vertically disposed, in response to only horizontal movement of the trim member with its main body portion horizontally disposed, said means for attaching comprising

(i) a single, substantially flat mounting rib portion having a series of ridges along the length thereof, said rib portion being integral with the base portion of the base member and projecting horizontally outwardly therefrom; and

(ii) a rearwardly opening, horizontally disposed, U-shaped

channel integral with the trim member having a corresponding series of ridges along the interior length thereof



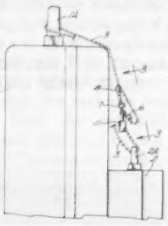
for gripping the mounting rib portion of the mounting base portion in interlocked relation when inserted therein.

4,114,234

LOCKABLE ATTACHMENT MEANS FOR LUGGAGE

Lavernon S. Hogenson, Box 66, Hingham, Mont. 59528

Filed May 20, 1977, Ser. No. 798,894
Int. Cl.[2] A45C *13/20;* **A45F** *5/10*
U.S. Cl. 16—114 R **1 Claim**



1. An attachment for temporarily interconnecting the handles of two pieces of luggage to enable convenient carrying of both pieces with one hand yet allowing both pieces to also rest on the ground without risk of tipping over, said attachment comprising,

a length of chain for looped passage through the luggage handles,

a lock including a shackle,

double eyelets disposed one each at opposite ends of said chain and adapted when an eyelet of one is registered with an eyelet of the remaining double eyelet to receive the lock shackle through the registered eyelets to secure the chain ends to one another to form a locked chain loop passing through the luggage handles, and

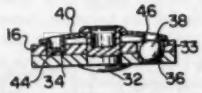
a snap fitting with swivel attached to a remaining eyelet of one of said double eyelets and engageable with a selected link of the chain to permit the removal of slack from the chain loop to achieve a desired relationship between the pieces of luggage regardless of varying size relationships between any two pieces of luggage to be carried

4,114,235

STAY FOR HINGED MEMBERS

Richard Charles Remington, Pompton Plains, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

Filed Jun. 14, 1977, Ser. No. 806,482
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—139 **10 Claims**



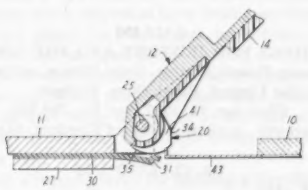
1. A stay for hinged members comprising a pair of arms each having one end adapted to be connected to a hinged member and each having another end with a hole therethrough, said other ends of said arms being overlapped with said holes aligned, a spring plate superposed with said overlapped ends of said arms ad having a hole therethrough aligned with said holes through said arms, means including a pivot pin extending through said holes for joining said arms and said spring plate and for permitting said arms to turn relatively about said pivot pin, and means coupling said spring plate to one of said arms for turning movement therewith relative to the other arm, said other arm having a detent projection at its said other end which turns with said other arm relative to said one arm, and said spring plate having a detent recess for receiving said projection when said arms are turned relatively to a predetermined position.

4,114,236

HINGE STRUCTURE FOR PLATEN COVERS

John D. Vandervort, Cottage Grove, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Jul. 28, 1977, Ser. No. 819,764
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—142 **5 Claims**

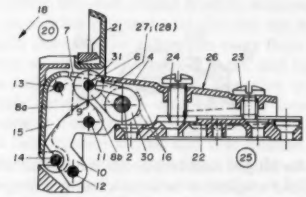


1. In a copy machine having a platen for supporting an original document for the purpose of exposing the same to impart an image to a photosensitive member and having a cover pivotally mounted along one edge thereof to cover and hold the original in place on the platen, the improvement comprising a latching spring in the form of a wide leaf spring positioned along said one edge of the cover, a cam secured to the cover and extending axially the width of the leaf spring and engaging the leaf spring along its length, said cam having a substantially planar locking surface portion which, when engaged by said leaf spring, will apply a torque to the cover forcing the same about the pivot axis of the cover toward said platen, and an arcuate transition surface portion described by an arc eccentric to the pivot axis of said cover which transition surface portion engages said spring and provides a torque on the cover as said cover is moved from said platen, the torsional force of which is sufficient to counterbalance the weight of the cover and hold the cover in a fixed position when the cover is raised from the platen to an angle of between about 20 and 90°.

4,114,237
DOOR HINGE

Alfred Grass, Konsumstrasse 492, A-6973 Hochst/Vlbg., Austria

Filed Nov. 3, 1976, Ser. No. 738,619
Claims priority, application Austria, Nov. 7, 1975, 8517/75
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—145 11 Claims



1. In an articulated hinge for a door including outer and inner link members each connecting between the door and the stationary frame by axially spaced pivot pins, the improvement comprising a resilient member interposed between the stationary frame and the innermost of said links, characterized in that said resilient member comprises:

a coiled spring member having an intermediate U-shaped extension projecting from oppositely wound co-axial convolutions, said convolutions terminating in outer free legs that extend toward and at an oblique angle to said U-shaped extension;

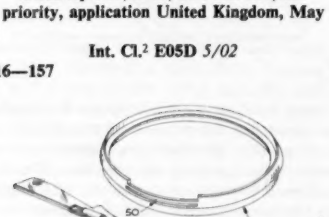
means supporting said coiled spring member on said stationary frame with said U-shaped extension contacting said innermost lever at a portion between its pivoted ends and thereby urging said innermost lever to a closed position of said door; and

means supporting said free legs whereby said coil spring is biased with said U-shaped extension urged against said portion of said inner link member toward the closed position of said door.

4,114,238
HINGE FOR JEWELRY AND THE LIKE

Robert George Powell, Warley, Great Britain, assignor to Harman Brother Limited, Birmingham, England

Filed Apr. 13, 1977, Ser. No. 786,992
Claims priority, application United Kingdom, May 12, 1976, 19509/76
Int. Cl.[2] E05D *5/02*
U.S. Cl. 16—157 7 Claims

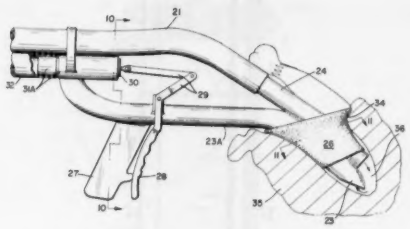


1. A hinge comprising two leaves one provided with at least one hinge knuckle and the other provided with a plurality of hinge knuckles, each leaf comprising two juxtaposed flat laminations reinforcing each other, a lamination of one leaf being provided with said at least one knuckle and a lamination of the other leaf being provided with said plurality of knuckles, and the other laminations each forming an abutment contacting one another edge on edge when the hinge is open.

4,114,239
METHOD AND APPARATUS FOR QUIETING A FOWL EVISCERATING DEVICE

Keener D. McClelland, 110 Southampton Rd., Hattiesburg, Miss. 39401

Filed Mar. 4, 1977, Ser. No. 774,478
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—45 8 Claims



1. The method of reducing the noise level surrounding the work area where lungs and/or trachea are removed by vacuum from a previously eviscerated fowl having a vent end opening comprising:

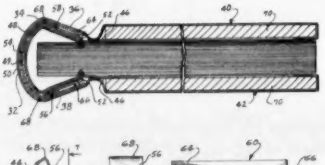
a. subjecting the fowl evisceral cavity to a vacuum while simultaneously providing for replacement air to flow into the cavity to both replace the air moved by the vacuum and to fill the void left by suction removal of the lungs and trachea, and

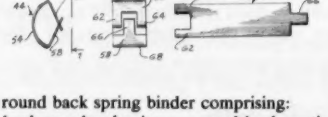
b. maintaining a seal, between the vacuum and replacement air introducing instrumentality, and the perimeter of the vent opening in the carcass of the fowl to retain the noise of high velocity turbulent air flow within the cavity within the eviscerated carcass.

4,114,240
ROUND BACK SPRING BINDER

Joel J. Nackenson, Valley Stream, N.Y., assignor to J.J. Lester & Co., Inc., Valley Stream, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,925
Int. Cl.[2] B42F *1/00*
U.S. Cl. 24—67.11 7 Claims





1. A round back spring binder comprising:

(a) a back member having a curved back section, a pair of side sections extending therefrom, and a pair of stiffener strips on said side sections,

(b) a pair of cover panels hingedly connected to said side sections, and

(c) spring clamp elements mounted on said back member and operating between its back and side sections,

(d) said spring clamp elements comprising a curved spring yoke and a pair of arms extending integrally therefrom, said arms being secured to said stiffener strips,

(e) said integral arms of the spring clamp elements having laterally offset end portions and said spring yoke of the spring clamp elements being bowed to bias said integral

arms toward each other such that their offset end portions are normally held in intersecting relationship,

(f) said integral arms of the spring clamp elements, when secured to the stiffener strips, being spread apart against the tension in the bowed spring yoke,

(g) thereby imparting a spring bias in the back member of the binder sufficient to hold its side sections in tensioned engagement with each other prior to placement of insert material between them, and sufficient to enable said side sections to tensionally engage and hold insert material placed between them.

4,114,241

INTERLOCKING CLAMPS FOR PIPING AND CABLE

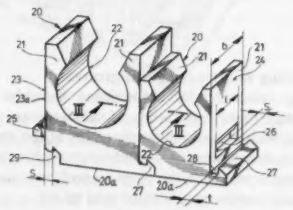
Heinz Bisping, Munich, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 20, 1977, Ser. No. 798,937

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624333

Int. Cl.² F16L *3/22*

U.S. Cl. 24—81 CC **13 Claims**



1. A clamp for holding pipe, cable and the like, said clamp comprising a pair of side walls each having an outwardly facing surface directed in the opposite direction to the outwardly facing surface of the other side wall and an inwardly facing surface directed toward the inwardly facing surface of the other said side wall, and a base interconnecting said side walls, each said side wall having a pair of spaced edges extending upwardly from said base, the inwardly facing surfaces of said side walls and said base forming an opening for holding pipe, cable and the like and the opening having an axis extending generally in the direction from one upright edge to the other upright edge of one of said side walls, wherein the improvement comprises that one said side wall having a detent extending outwardly from the outwardly facing surface thereof and the other said side wall having an opening in the outwardly facing surface thereof for receiving a corresponding said detent so that said clamp can be interlocked with other said clamps by inserting said detent in a direction perpendicular to said side wall into a corresponding said opening on another said clamp and by inserting said detent on still another said clamp into the opening on said clamp.

4,114,242

CABLE GRIP GRIPPING APPARATUS

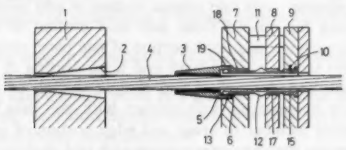
Kurt Luthi, Gwatt bei Thun, Switzerland, assignor to Losinger AG, Bern, Switzerland

Filed Mar. 30, 1977, Ser. No. 782,834

Claims priority, application Switzerland, Feb. 11, 1977, 1731/77

Int. Cl.² F16G *11/00*

U.S. Cl. 24—115 R **8 Claims**



1. In an apparatus for gripping one or more tapered segmented grips seated at the ends of conical passageways through an anchor block by means of which one or more cables consisting of wires or strands are anchored under tension in said anchor block, said apparatus being disposed between said anchor block and a tensioning jack so as to be movable along said cables passing therethrough for detensioning the tensioned said cable or cables, characterized in that it comprises a number of axially split cylindrical gripping means disposed in axial alignment with the respective number of said cables, each of said gripping means being introduceable in the respective segmented grip in the anchor block to grip said segmented grip, means engaging said gripping means to move the same axially and unseat said segmented grip from its seat and to displace it axially away from said anchor block, and means for engaging and radially compressing said gripping means.

4,114,243

PROCESS FOR PRODUCING CATHODE FOR CATHODE RAY TUBE OF DIRECTLY HEATING TYPE

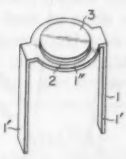
Ko Soeno; Toshio Doi, both of Hitachi; Tomio Iizuka, Ibaraki; Hiroshi Sakamoto; Hisashi Ando, both of Hitachi; Tetsuo Oyama, Takahagi, and Akira Misumi, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1977, Ser. No. 775,618

Claims priority, application Japan, Mar. 9, 1976, 51-24680

Int. Cl.² H01J *9/04*

U.S. Cl. 29—25.14 **24 Claims**



1. A process for producing a cathode for a cathode ray tube of directly heating type, which comprises:

(a) preparing a compound plate of predetermined thickness comprising a heat-resistant and electroconductive flat metal plate and a thin metal layer having an affinity to the flat metal plate, the thin metal layer being diffusion bonded to the flat metal plate,

(b) shaping said compound plate into a cathode substrate body having two leg pieces extended in the same direction and a flat part being connected to one end of each leg piece and having said metal layer on an outer surface of said flat part,

(c) forming a bonding layer, for bonding a thermionic emission layer, by diffusion bonding powders of a thermally diffusible metal having an affinity to said metal layer to the outer surface of the flat part, and

(d) forming the thermionic emission layer on the surface of the bonding layer.

4,114,244

METHOD FOR MOUNTING OF ELECTRICAL COMPONENTS, IN PARTICULAR ELECTROLYTE CAPACITORS

Rudolf Klaschka, Tannenweg 9, 7896 Wutoschingen, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 781,676

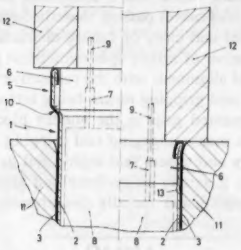
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614497

Int. Cl.² H01G *7/00*

U.S. Cl. 29—25.41 **10 Claims**

1. A method for encapsulating an electrical or electronic component in a housing, wherein said housing has an opening sealed by a resilient plug, said method comprising providing said housing opening with a widened neck rim portion, insert-

ing said component into said housing, disposing said plug in said widened neck portion, and reducing the width of said neck



portion by pushing said housing into a crimping die for holding said plug under compression at the opening of said housing.

4,114,245

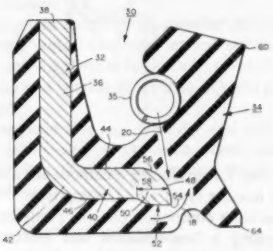
PRESSURE SHAFT SEAL METHOD

Dean R. Bainard, Clover, S.C., assignor to Garlock Inc., Rochester, N.Y.

Division of Ser. No. 622,876, Oct. 16, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,724

Int. Cl.[2] B23P *15/00*; B29G *1/00*

U.S. Cl. 29—156.4 R **6 Claims**



1. A method for reducing bonding cement bond breakage in pressure shaft seals of the type including a reinforcing shell having a cylindrical portion and a radially inwardly extending flange and an elastomeric sealing member supported by the radial flange and including portions of elastomer of said member bonded by bonding cement to both axially inner and outer sidewalls and to an endwall of the radial flange, comprising steps of forming an axially extending offset on the outer sidewall of said radial flange adjacent the endwall thereof, said offset having a size and shape effective to disturb the flow of elastomer at said endwall, and molding said elastomeric member onto said reinforcing shell such that the elastomer flows axially inwardly over said offset and then toward said endwall such that said flow tends not to wipe said bonding cement off of said endwall during said molding step.

4,114,246

METHOD OF AND MEANS FOR MAKING TUNED VISCOUS TORSIONAL VIBRATION DAMPERS

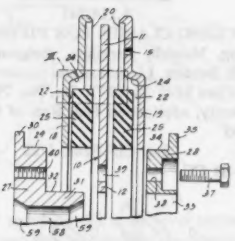
Gordon W. Kamman, Elma, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,256

Int. Cl.[2] F16F *15/16*

U.S. Cl. 29—451 **15 Claims**

1. A method of making a tuned viscous torsional vibration damper assembly of the type having supporting disk means with a radially outwardly extending circular body and a radially inner hub portion adapted to be secured to a rotary member such as a crankshaft subject to vibrations to be damped by the damper, said body being received concentrically within a radially inwardly opening annular working chamber of an annular inertia mass, a viscous damping medium in said chamber between shear film spaced working surfaces of said body and said inertia mass, and said inertia mass having concentric annular grooves at opposite sides of and facing axially toward said body contiguous to the opening from said chamber, with elastic tuning spring, spacing and sealing rings coupling opposing surface areas of said inertia mass in said grooves and opposing surface areas on said body, comprising:



assembling said rings in said grooves;

placing concentricity maintaining shoulder means across radially inner open sides of said grooves and in engagement with radially inner diameter of the rings whereby to assure concentricity of said rings within the grooves;

effecting bonding of the rings to said opposing surface areas of said inertia mass and of said body;

and after said bonding removing said concentricity maintaining shoulder means.

4,114,247

METHOD OF ASSEMBLING A PANEL ASSEMBLY STRUCTURE

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Division of Ser. No. 358,950, May 10, 1973, Pat. No. 4,063,393. This application Jul. 5, 1977, Ser. No. 812,766

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—453 **9 Claims**

1. A method of assembling a panel assembly structure, comprising: providing a preformed panel member which includes a fully preformed marginal portion which is defined by an integral hook section extending transversely thereof, and a generally flat deformable tongue section projecting from said hook section and terminating in an edge portion; providing another preformed member which includes a fully preformed marginal slotted section which includes a hook portion extending transversely thereof, and a generally rigid and unyielding abutment shoulder spaced from said hook portion and integrally connected therewith by a base portion; interfitting said hook portion of said panel member beneath said hook portion of said other member with said tongue section of said panel member overlying but spaced from said base portion of said other member; urging said hook portion of said panel member laterally into secure contact with said hook portion of said other member; and depressing said tongue section of said panel member downwardly into contact with said base portion of said other member to bring said edge portion of said tongue section into wedging engagement with said abutment shoulder of said other member without deforming or otherwise distorting said abutment shoulder and without permanently distorting

or altering the configuration of either of said preformed members.

4,114,248

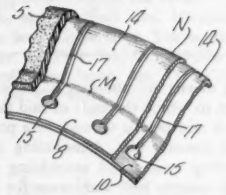
METHOD OF MAKING RESILIENTLY COATED METALLIC FINGER SEALS

William E. Smith, and Roy G. Nelson, both of Lake Park, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 535,645, Dec. 23, 1974, Pat. No. 4,022,948. This application Sep. 21, 1976, Ser. No. 725,059

Int. Cl.[2] **B23P** *3/00, 19/04*

U.S. Cl. 29—460 **6 Claims**



1. A method of forming a seal means for use between a stationary member and a movable member comprising

(1) forming two metallic members of a desired shape so that its forward end will coact with the stationary member and its rearward end will coact with a movable member,

(2) forming the rear part of said members having fingers with slots therebetween,

(3) fixing the two metallic members together in an offset manner so that the slots of each metallic member are positioned between the fingers of the other metallic member with their mating surfaces therebetween being in intimate contact,

(4) cleaning the exposed surfaces of the two metallic members where a resilient coating is to be placed,

(5) applying a thin layer of a primer to the two metallic members where a resilient coating is to be placed, said primer preventing the formation of oxides on the surfaces where it is desired to have a bonded resilient coating,

(6) placing an uncured resilient coating material around the fingers of said members of said metallic members to a point adjacent the closed ends of the slots leaving the ends of the slots exposed,

(7) placing an uncured resilient coating material in the exposed ends of the slots,

(8) shaping the resilient coating material to its desired shape for use as a seal,

(9) curing the resilient coating material.

4,114,249

METHOD OF ASSEMBLING STORAGE SYSTEM

Leonard R. Clark, Roslyn, and David W. Meehl, Hatboro, both of Pa., assignors to Standard Pressed Steel Co., Philadelphia, Pa.

Division of Ser. No. 668,371, Mar. 19, 1976, Pat. No. 4,042,097. This application May 26, 1977, Ser. No. 800,770

Int. Cl.[2] **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—513 **2 Claims**

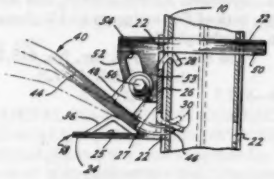
1. A method of assembling a storage system including the steps of:

providing support posts having aligned slots extending along at least one face thereof;

erecting said support posts in a generally vertical position whereby said slots extend along a generally vertical line and face in the same direction;

providing a support member having a first leg providing a track surface along which storage containers can slide and on which storage containers can be supported, and having a second leg providing a guide surface for guiding storage containers sliding along said track surface, said second leg being provided with first connecting means at one end and second connecting means at the other end, said connecting means including a hook member and a tab member each of said tab members forming an angle greater than 90° with the surface portion of said second leg located between said hook member and said tab member;

inserting said hook members into aligned slots on said support posts so that said hook members underlie the outer surface of said post members, and rotating said support member to insert said tab members into other aligned slots on said support posts; and,



thereafter applying a bending force to said tab members to bend said tab members toward said hook members until said tab members form an angle less than 90° with the surface portion between said hook members and said tab members whereby said tab members underlie the outer surface of said support post members.

4,114,250

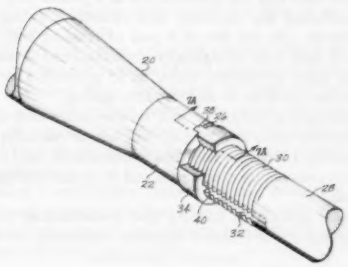
METHOD OF FIXING A THREADED TUBE TO A THREADED SHANK OR NIPPLE

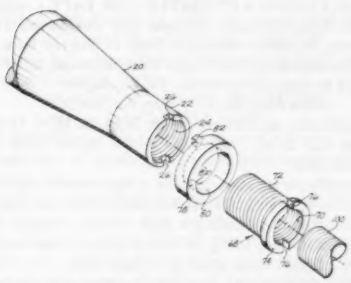
Robert K. Dent, 17765 Beach Dr. N. E., Seattle, Wash. 98155

Filed Aug. 16, 1976, Ser. No. 714,600

Int. Cl.[2] **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—517 **15 Claims**





15. The process of rigidly connecting a tube, having an end

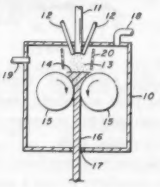
wall and having an internally threaded bore, to an externally threaded member, comprising, providing slots in the end wall of the tube; providing a sleeve on the externally threaded member and with the sleeve abutting the end wall of the tube; and cold pressing said sleeve and providing for metallic flow thereof into the slots in the end wall of the tube and into the threads of the externally threaded member.

4,114,251

PROCESS FOR PRODUCING ELONGATED METAL ARTICLES

Raymond L. Southern, Lower Burrell, and Harry L. Bishop, Pittsburgh, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1975, Ser. No. 615,330
Int. Cl.[2] B22D *11/126*
U.S. Cl. 29—527.7 **1 Claim**



1. A process for producing an elongated metal article comprising:

A. maintaining a supply of molten metal;

B. providing a stream of molten metal from said supply of molten metal;

C. atomizing said molten metal by blasting said stream of molten metal with an inert atomizing gas to produce a downwardly flowing stream of molten metal particles at the melting temperature of said metal;

D. removing heat from said downwardly flowing particles while in an inert atmosphere to remove at least some heat of solidification but to maintain the particles at a temperature such that the particles are in a plastic condition;

E. directing the resultant downwardly flowing particles directly into the bite of a pair of rotating rolls arranged with their axes substantially horizontal and in substantially the same horizontal plane as to provide a bed of said heated particles in an inert atmosphere;

F. continuing directing said downwardly flowing heated particles onto said bed of said heated particles and continuing rotation of said rolls to consolidate said particles as they pass between said rolls and form said elongated metal article;

G. said atomizing, cooling and consolidating steps being carried out in a closed chamber containing an inert gas.

4,114,252

MANUFACTURING APPARATUS FOR TAPE CASSETTE

Tsuneyoshi Kon, Kawasaki; Hiroshi Toi, Yokohama; Tamiaki Matsuura; Kiyohiko Akanuma, both of Tokyo; Toru Takamiya, Yokohama, and Motosuke Usui, Matsudo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 26, 1977, Ser. No. 800,921
Claims priority, application Japan, May 28, 1976, 51-62700
Int. Cl.[2] B23Q *7/00;* **B23P** *23/00;* **B65H** *19/20*
U.S. Cl. 29—563 **7 Claims**

1. A manufacturing apparatus for a tape cassette comprising:

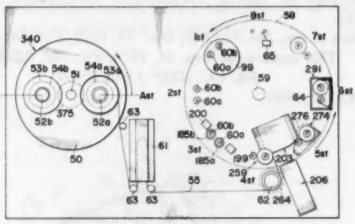
a rotary table having at least one pair of hub holding means for demountably holding a pair of hubs supplied to said rotary table and being movable along a predetermined transport path upon rotation of said table;

means for clamping an initial end of a supplied tape to one of said hubs held by said hub holding means;

tape winding means for winding a predetermined length of said supplied tape onto said one hub;

cutting means for cutting a trailing portion of said tape wound on said one hub;

means for clamping the terminal end of said cut tape to the other of said hubs;



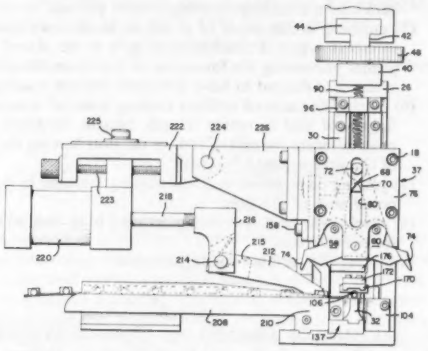
assembling means for mounting a cassette half, transporting said hubs to which the ends of said tape are clamped and on which said tape is wound, to a position adjacent to a mounted cassette half, demounting said hubs from said hub holding means and assembling said hubs into said mounted cassette half; and means for intermittently rotating said table to position said hub holding means at each of the other above-mentioned means.

4,114,253

APPLICATION FOR TERMINALS IN STRIP FORM

Phillip Eugene Loomis; Paul Elwood Martz, and Howard Charles Phillips, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 11, 1977, Ser. No. 795,825
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—566.2 **7 Claims**



1. An applicator for crimping terminals onto the ends of wires, said applicator being intended to be mounted in a bench press or the like, said applicator comprising:

frame means, a crimping site in said frame means, a ram in said frame means, crimping die means on said ram, said ram being reciprocable along a first path towards and away from said crimping site, an anvil in said frame means, said anvil being receiprocable along a second path towards and away from said crimping site, said second path extending transversely of said first path,

actuating means for moving said anvil and said ram along said paths, said actuating means having timing means for ensuring arrival of said anvil at said crimping site prior to arrival of said crimping die at said crimping site,

terminal strip feeding means for feeding a strip of said terminals to said anvil and positioning the leading terminal of

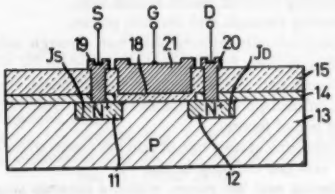
said strip on said anvil when said anvil is remote from said crimping site, and shearing means for shearing said leading terminal from said strip prior to movement of said anvil towards said crimping site whereby, upon positioning the end portion of a wire at said crimping site with the axis of said wire extending in the same direction as said second path, and upon positioning a terminal on said anvil, and upon provoking said actuating means, said terminal and anvil are moved to said crimping site and said wire is positioned in said terminal, and said terminal is thereafter crimped onto said wire upon arrival of said crimping die means at said crimping site.

4,114,254

METHOD FOR MANUFACTURE OF A SEMICONDUCTOR DEVICE

Teruaki Aoki, Tokyo, and Motoaki Abe, Hiratsuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,326
Claims priority, application Japan, Apr. 17, 1975, 50-46698
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **10 Claims**



1. A method for the manufacture of a semiconductor device comprising:

a. forming a polycrystalline silicon layer containing 2 to 45 atomic percent of oxygen atoms on a semiconductive single crystal substrate,

b. forming a masking layer on said polycrystalline silicon layer,

c. removing partially said masking layer in predetermined areas to provide windows through said masking layer to said polycrystalline layer,

d. oxidizing the exposed portions of said polycrystalline silicon layer, and

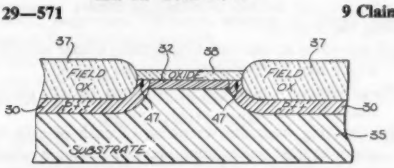
e. forming an electrode on the oxidized portion below one of the windows.

4,114,255

FLOATING GATE STORAGE DEVICE AND METHOD OF FABRICATION

Phillip J. Salsbury, Sunnyvale; George Perlegos, Santa Clara, and William L. Morgan, Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 714,879, Aug. 16, 1976, abandoned. This application May 2, 1977, Ser. No. 792,496
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **9 Claims**



1. In a process for fabricating a floating gate memory device on a silicon substrate of a first conductivity type, the steps of:

defining a channel area on said substrate with a masking means which includes silicon nitride;

subjecting said substrate to a dopant of said first conductivity type so as to form first doped regions adjacent to first opposite sides of said channel area;

forming an oxide layer on said substrate abutting said masking means;

removing said masking means;

forming a floating gate insulated from said substrate above said channel area;

forming a source and drain region of a second conductivity type at second opposite sides of said channel area;

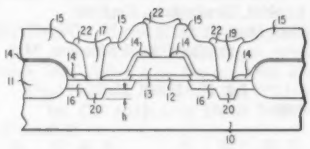
whereby regions along said first sides of said gate are doped, thereby permitting charge to be more easily injected into said floating gate.

4,114,256

RELIABLE METAL-TO-JUNCTION CONTACTS IN LARGE-SCALE-INTEGRATED DEVICES

Louis Robert Thibault, Piscataway, and Leopoldo Dy Yau, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 24, 1977, Ser. No. 809,667
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **1 Claim**



1. A method for making reliable low-resistance electrical connections to shallow-junction regions of an LSI device, said method comprising the steps of

forming a relatively thick insulating layer on the front surface of said device overlying said shallow-junction regions

forming contact window openings in said insulating layer respectively overlying only central portions of said shallow junction regions,

in a single gettering step, gettering damage sites from both the front and back surfaces of said device and, during said single gettering step, introducing an impurity into said device via said contact window openings to form relatively deep junction portions in the central portions only of said shallow-junction regions in direct alignment with said openings,

and forming a conductive pattern on said insulating layer and in said contact window openings directly overlying said relatively deep junction portions to establish electrical connections to said regions.

4,114,257

METHOD OF FABRICATION OF A MONOLITHIC INTEGRATED OPTICAL CIRCUIT

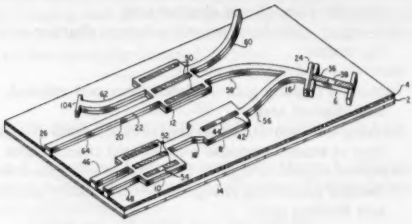
David Walter Bellavance, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 23, 1976, Ser. No. 726,092
Int. Cl.² B01J *17/00*
U.S. Cl. 29—572 **3 Claims**

1. A method of fabricating a monolithic integrated optical circuit comprising:

fabricating a multi-layer continuous waveguide structure on the planar surface of a semiconductor substrate, said waveguide structure having planar open areas for the subsequent fabrication of electro-optic devices therefrom, one of said layers capable of propagating light therethrough;

fabricating a light emitting device on at least one of the above listed members in such a relationship to the waveguide structure so as to transmit light thereto;



depositing contact means upon the opposite parallel face to said planar surface of said semiconductor substrate and upon a portion of said light emitting device; and

fabricating said electro-optic devices by depositing metal patterns on top of said planar open areas.

4,114,258

METHOD OF MAKING A STATOR ASSEMBLY

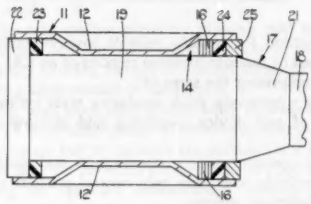
Keith James William Beech, Walsall, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 19, 1977, Ser. No. 798,347

Claims priority, application United Kingdom, May 28, 1976, 22379/76

Int. Cl.[2] H02K *15/06*

U.S. Cl. 29—596 **3 Claims**



1. A method of manufacturing a dynamo electric machine stator assembly wherein the stator assembly comprises a hollow cylindrical yoke having therein a plurality of angularly spaced axially extending radially inwardly projecting poles, and a sinusoidal field winding engaging the poles, the winding including a plurality of axially portions each engaged between a respective pair of circumferentially adjacent poles, and a plurality of curved end portions each curved end portion extending around an end of a respective pole and interconnecting an adjacent pair of axial portions, circumferentially adjacent curved end portions of the winding being disposed at opposite axial ends of the winding respectively, the method comprising the steps of axially inserting a reduced diameter sinusoidal field winding into the yoke with the axial portions of the winding aligned with the spaces between respective pairs of poles, expanding the winding radially to engage the axial portions of the winding between their respective pairs of poles, and, securing the expanded wiring in position in the yoke by subjecting the winding to a compressive loading in an axial direction while holding the winding against radially inward collapse, the magnitude of the axial loading applied to the winding being sufficient to cause initial elastic deformation of the winding into contact with the poles and the inner surface of the yoke and subsequent plastic deformation of the winding whereby upon release of axial loading the winding remains in its deformed configuration engaging the poles and the inner surface of the yoke and so gripping the poles and the yoke so as to retain itself in position in the yoke.

4,114,259

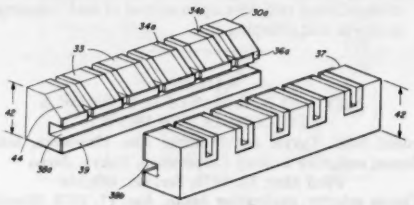
METHOD OF MAKING A HIGH DENSITY MULTITRACK MAGNETIC HEAD

Jelmer Dorreboom, Olivenhain, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Division of Ser. No. 735,729, Oct. 26, 1976, Pat. No. 4,084,199. This application Sep. 26, 1977, Ser. No. 836,862

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. In the method of forming the front face of a multitrack magnetic head, the steps of:

(a) cutting a number of widthwise slots into a bar of ferrite,

(b) bonding ceramic pieces in said slots,

(c) slotting through said ceramic pieces,

(d) longitudinally cutting said bar through said ceramic pieces, thereby to form bar pieces,

(e) placing gap defining non-magnetic means along at least one of the opposing surfaces resulting from the cutting of said bar of ferrite,

(f) chamfering at least one of said bar pieces to define a depth for said gap defining means,

(g) placing said bar pieces within a ceramic surround that has a depth greater than the depth of said bar,

(h) placing magnetic shields within the slotted ceramic pieces,

(i) placing glass over the bar pieces and within said surround, and

(j) heating said surround with its contents to cause said glass to melt and create a unitary lattice of glass filling the chamfer and bonding all parts, including the surround, together.

4,114,260

INDUSTRIAL BATTERY STACK, AND APPARATUS AND METHOD FOR STACKING, ALIGNING AND BURNING SAME

Hector L. DiGiacomo, Lafayette Hill, and John A. Sacco, Wernersville, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Division of Ser. No. 652,715, Jan. 27, 1976, abandoned. This application Apr. 1, 1977, Ser. No. 783,959

Int. Cl.[2] H01M *10/14*

U.S. Cl. 29—623.1 **1 Claim**

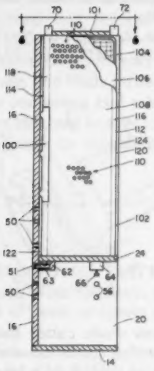
1. A method of stacking wrapped battery plates with respect to adjacent and discrete overlapping battery separators comprising the steps of:

(a) providing at least one substantially planar surface against which said battery plates are to be stacked;

(b) providing a plurality of wrapped battery plates to be stacked;

(c) applying over the wrapping of each of said wrapped plates at least one spacing member having a substantially U-shaped cross section for engaging at least one vertical wrapped edge of each of said wrapped battery plates, said spacing member having projections protruding therefrom a distance sufficient to provide the desired overlap of said separators beyond said plates; and

(d) positioning said wrapped battery plates and separators against said surface to thereby produce a properly aligned



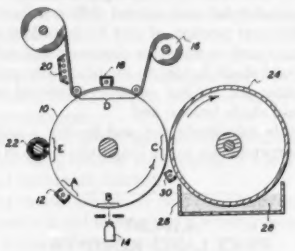
battery stack wherein said separators uniformly overlap said battery plates.

4,114,261

METHOD OF MANUFACTURE OF A XEROGRAPHIC MICROFIELD DONOR

Ernest A. H. Weller, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 546,589, Feb. 3, 1975, Pat. No. 3,998,185.
This application May 24, 1976, Ser. No. 689,282
Int. Cl.[2] G03G *15/08*
U.S. Cl. 29—624 **11 Claims**



1. The method of manufacture of a xerographic microfield donor for toner transportation comprising the steps of

forming an electrically conductive toner support member,

establishing a plurality of pairs of adjacent electrical microfields on the surface of said support member, and

continuously reversing the direction of the established microfields.

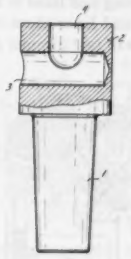
4,114,262

CABLE CONNECTOR

Bent Franck, Bagsvaerd, Denmark, assignor to Dansk Signal Industri A/S, Hvidovre, Denmark

Continuation of Ser. No. 603,985, Aug. 12, 1975, abandoned.
This application Nov. 18, 1976, Ser. No. 742,928
Claims priority, application Denmark, Aug. 14, 1974, 4328/74
Int. Cl.[2] H01H *69/00*
U.S. Cl. 29—628 **1 Claim**

1. A method of connecting an electrical cable connector to another electrically conductive object in which other object a hole is provided for receiving part of a connector element which connector element provides a first pin dimensioned for being driven into the hole, a head having a first bore extending radially relative to a second bore which extends coaxilly with the axis of the first pin and intersecting the first bore and dimensioned for receiving a second pin dimensioned for being driven into the second bore and tightly engaging a cable received in the first bore, said method comprising inserting the



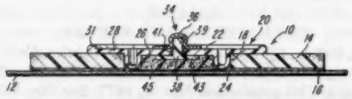
cable in the first bore placing the first pin within the hole of the object and placing the second pin within the second bore and applying force upon the second pin to drive the same into the second bore to engage the cable and at the same time to drive the first pin into the hole.

4,114,263

METHOD OF MANUFACTURING MEDICAL ELECTRODES

Roman Szpur, 2685 Culver Ave., Dayton, Ohio 45429

Filed Mar. 14, 1977, Ser. No. 777,313
Int. Cl.[2] A61B *5/04*; H01R *9/02*
U.S. Cl. 29—630 R **4 Claims**



1. A method of producing a medical electrode adapted to be attached to the skin of an individual, comprising the steps of adhesively attaching a retaining sheet of flexible material to a carrier sheet of adhesive releasing material, cutting through the retaining sheet to only the carrier sheet to form a pad defining an opening confining a separate segment of the retaining sheet, removing the segment of the retaining sheet from the carrier sheet, forming a hub member from a flexible material and with the hub member defining a chamber surrounded by a flange portion, mounting an electrical conductor on the hub member with the conductor extending through to the chamber, locating within the chamber an electrically conductive resilient patch, inserting the hub member and the patch within the opening in the pad, and attaching the flange portion of the hub member to the pad around the opening.

4,114,264

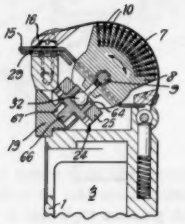
CLIPPER MECHANISM

Alexis Emmanuel Buchholz, Hauterive, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Jun. 24, 1977, Ser. No. 809,686
Claims priority, application United Kingdom, Jun. 29, 1976, 27109/76
Int. Cl.[2] B26B *19/10*
U.S. Cl. 30—34.1 **9 Claims**

1. An electric dry shaver comprising a cutter, means for mounting said cutter for arcuate oscillation about an axis to effect a shaving action, a driver having an end secured to said cutter and an opposite free end terminated by a ball and

adapted to arcuately oscillate about said axis, a trimmer element, means mounting said trimmer element for linear reciprocation parallel to said cutter axis to effect a hair trimming action, and a coupling mechanism including a lever provided with an opening, means defining a pivot axis for said lever and means operably connecting said lever to said trimmer element, whereby oscillation of said lever about said pivot axis effects said linear reciprocation of said trimmer element, and an inter-



mediate member operably interposed between said driver and said trimmer element, said ball end extending into said opening in said lever, said opening having a dimension greater than the arcuate travel of said arcuately oscillating ball end in said opening, said intermediate member being selectively movable into and from said opening to be selectively operatively engageable and disengageable with said ball end of said driver respectively to establish and to break a driving connection between said driver and said trimmer element.

4,114,265

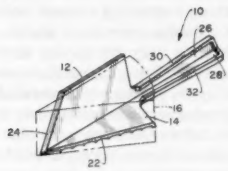
CAKE CUTTER AND SERVER

Robert L. Bailey, 3039-½ Eighth Ave., Los Angeles, Calif. 90018

Continuation-in-part of Ser. No. 772,557, Feb. 28, 1977, abandoned. This application Nov. 4, 1977, Ser. No. 848,540

Int. Cl.[2] **B26B** *11/00*

U.S. Cl. 30—122 **9 Claims**



1. A pastry cutter and server comprising:

a body section being divided into a first section and a second section, said first section being pivotally connected by hinge means to said second section;

a first handle section attached to said first section;

a second handle section attached to said second section, said first and second handle sections cooperating together to form a single handle structure;

said second section having a sharpened edge on the free edge thereof, whereby said sharpened edge may be used to cut through pastry when the first section is in alignment with the second section;

said hinge means permitting said first and second sections to be rotated right or left until said first and second sections are located at substantially right angles to one another whereby said cutter may now be employed as a left or righthanded server.

4,114,266

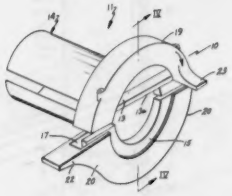
APPARATUS AND METHOD FOR ROTARY CUTTING OF ROLLED WINDOW SHADES AND THE LIKE

Paul J. Erpenbeck, Muskegon, Mich., assignor to Breneman, Inc., Cincinnati, Ohio

Filed Mar. 2, 1977, Ser. No. 773,439

Int. Cl.[2] **B25F** *3/00;* **B26B** *14/00, 27/00;* **B26D** *3/00*

U.S. Cl. 30—123 **14 Claims**



1. A manual window shade cutter assembly for cutting a generally cylindrical rolled shade including:

a longitudinally slotted shade holder having a handle portion of a size and shape to be gripped by the human hand and with longitudinally-extending slot-like separations dividing at least parts of said handle portion into component portions, said slotted shade holder having a longitudinal internal opening shaped to support a rolled shade during cutting and having an integral cutting guide oriented transversely of said internal opening and defining a generally annular wall portion;

a generally annular blade holder having a hinge and a separation dividing said blade holder into at least two relatively moveable hinged members; each of said members having a circularly curved follower portion whose radii converge toward the center of said blade holder; one of said blade holder members having a blade-supporting slot aligned parallel to said curved follower portion; said curved follower portion of said blade holder shaped to complement and to slideably clamp around said cutting guide of said shade holder to longitudinally position said blade holder for guided relative rotational movement around said shade holder; and

a blade within said blade slot and having a cutting edge aligned perpendicular to the longitudinal axis of said blade holder.

4,114,267

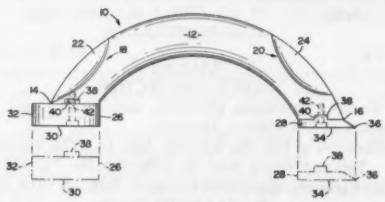
PRICE LABEL REMOVER

John P. Marchio, 2945 Denham Rd., and Hector Figueredo, 2960 Denham Rd., both of Cocoa, Fla. 32922

Filed Aug. 8, 1977, Ser. No. 822,534

Int. Cl.[2] **A47L** *25/00*

U.S. Cl. 30—172 **5 Claims**



1. A label removing device of the type primarily intended for use in removing adhesive labels from a substrate, said device comprising: handle means comprising a body having first and second end portions; first scraper means operatively disposed on said first end portion, said first scraper means comprising a block including a scraping edge formed thereon, whereby adhesive labels may be removed from a relatively

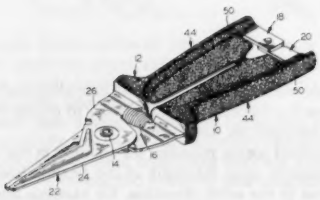
hard substrate, said block further including a substantially planar bottom portion for contacting said substrate, said scraping edge defining a plane which is substantially perpendicular to said bottom portion; and second scraper means operatively disposed on said second end portion, said second scraper means comprising a blade including a sharpened edge formed thereon, whereby adhesive labels may be removed from a relatively soft substrate, said blade further including a substantially planar base for contacting said substrate, said sharpened edge being formed on said base so as to extend outwardly from said second end portion in substantially parallel relation thereto.

4,114,268

SHEARS WITH IMPROVED LATCH FOR HANDLES

William J. Hildebrandt, West Simsbury, and Richard H. Rathbun, Oakdale, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Nov. 2, 1977, Ser. No. 847,698
Int. Cl.[2] B26B *13/16*
U.S. Cl. 30—262 **9 Claims**



1. A hand tool comprising:

A. a pair of operating members each having jaw portions at one end thereof;

B. pivot means pivotably assembling said operating members for pivotal movement of said jaw portions towards each other into a closed position and away from each other into an open position;

C. synthetic resin handle members affixed to the other end of said operating member for gripping by a user to effect said pivotal movement thereof;

D. spring means operatively connected between said operating members and biasing said operating members into the open position thereof; and

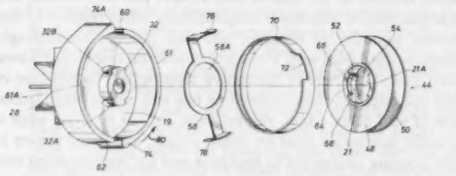
E. releasable latch means integrally formed on said handle members to maintain said operating members in said closed position, said latch means comprising opposed arm members adjacent the outer ends of said handle members extending generally perpendicularly to the longitudinal axis of said handle members into overlying relationship, one arm member having a latch aperture therethrough spaced inwardly from the free end thereof and the other of said arm members having a latch post projecting from the surface thereof adjacent said one arm member and into said latch aperture thereof, either one of said arm members having an integral hinge portion adjacent the body of the handle member thereof permitting pivotal movement of the outer end portion thereof towards and away from the other one of said arm members for insertion and removal of said latch post from said latch aperture, said latch post having a laterally extending shoulder spaced inwardly from the outer end thereof engaged with a cooperating shoulder surface of said one arm member about said latch aperture, said biasing pressure of said spring means operating to maintan said cooperating shoulders in engagement in the closed position of said operating members.

4,114,269

ROTARY CUTTING ASSEMBLY

George Charles Ballas, Sr., Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Filed Dec. 3, 1976, Ser. No. 747,318
Int. Cl.[2] A01D *35/26*; A01G *3/06*
U.S. Cl. 30—276 **24 Claims**



1. Apparatus for cutting vegetation and the like, comprising:

head means rotatable about a rotational axis in a cutting plane and having a concentrically located open-end storage portion for a spool means and a peripherally located support portion having a solid curvilinear bearing surface,

said curvilinear bearing surface of said head means including a teardrop-shaped section extending outwardly with respect to the periphery of said head means,

driving means for rotating said head means in said cutting plane,

a flexible non-metallic line member having a coiled portion in said storage portion of said head means and further having an uncoiled portion extending from said coiled portion into said cutting plane to and across said bearing surface and further continuing radially outwardly from the periphery of said head means,

spool means insertable in said storage portion of said head means through the open end and holding said coiled portion of said line member in said head means, said spool means including a keyway associated therewith,

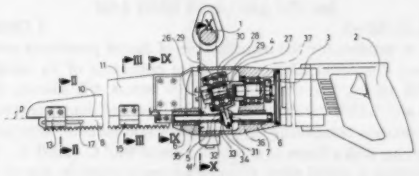
tab means on said head means in said storage portion, said keyway and tab means provided by semi-cylindrical flange members coaxial with said rotational axis and said semi-cylindrical flange members adapted to be axially interfitted and rotationally interlocked whereby an axially and radially secure interconnection is provided between said spool means and head means.

4,114,270

BUTCHER'S MEAT SAW

Rottger Jansen-Herfeld, Remscheid, and Stefan Elmer, Oetisheim, both of Fed. Rep. of Germany, assignors to Schmid & Wezel, Maulbronn, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,516
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1976, 2657665
Int. Cl.[2] G01C *15/10*; B27B *17/00*
U.S. Cl. 30—394 **16 Claims**



1. A reciprocating saw, comprising a housing; a guide element secured to said housing and having an edge defining a direction; an elongated blade element having a longitudinal succession of cutting teeth, a rear end, and an edge extending along and slidable on said edge of said guide element, one of said edges being V-shaped; a first plurality of tabs and a second

plurality of tabs transversely spaced from one another on another of said edges so as to define a V-shaped groove therebetween in which said one V-shaped edge is slidably received, said tabs of each of said first and second pluralities being longitudinally spaced from one another so as to define a first plurality of notches and a second plurality of notches therebetween, respectively, the tabs of said first plurality being longitudinally offset relative to the tabs of said second plurality so that said first plurality of notches is longitudinally offset relative to said second plurality of notches, and said notches alternatingly communicate with said V-shaped groove on respective lateral sides thereof, whereby successive longitudinal increments of said one edge are fully exposed on one and on the other lateral side of said other edges, respectively, so that said one edge is laterally accessible over its entire length; and drive means in said housing connected to said rear end for reciprocating said blade element in said direction wherein said tabs have faces defining said grooves and lying at an angle of between 30° and 90° to each other, and said faces overlap transversely of said direction.

4,114,271

VIBRATORY DENTAL TOOL

Scott P. Howa, Salt Lake City, Utah, assignor to Vibrabrush, Inc., Salt Lake City, Utah

Continuation of Ser. No. 574,864, May 6, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,946

Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—2 **4 Claims**

1. A method for creating dental prosthetic appliances comprising the steps of:

-adhering a pre-determined amount of dental prosthetic-forming material to the vibrating brush means of a vibrating dental tool;

-applying said dental prosthetic-forming material to a substrate with said dental tool; and

-shaping said material into said substrate to form a dental prosthetic appliance with said vibrating brush means.

4,114,272

PROCESS FOR THE MANUFACTURE OF DENTAL PROSTHESES

Albert Saragossi, 10, rue du Four, Paris, France (75006)

Filed May 5, 1976, Ser. No. 683,573

Int. Cl.[2] A61C *5/08;* **B05D** *1/08*

U.S. Cl. 32—8 **2 Claims**

1. A process for the manufacture of dental prosthesis comprising a metallic alloy substructure consisting of by weight 87.5% nickel, 5% chromium, 1.25% boron, 4% silicon, 2% iron and 0.25% carabon and various layers of dental ceramic, said process comprising (a) preheating said metallic alloy substructure with a flame to a temperature of 900° C.–1200° C., (b) projecting a metal alloy powder having a particle size of 50 microns and consisting of 50.8% cobalt, 17.0% nickel, 19% chromium, 0.8% boron, 8.0% silicon, 4.0% tungsten and 0.4% carbon by weight through said flame and onto said preheated metallic alloy substructure, (c) terminating the projecting step when a coating having a maximum thickness of about 1/10th of a millimeter has been deposited on said substrate, and then applying to said coating various layers of dental ceramic.

4,114,273

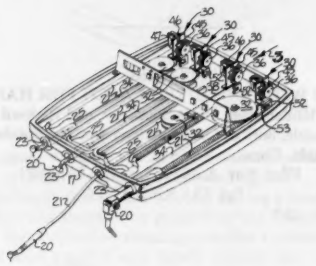
HANDPIECE INSTRUMENT CONSOLE APPARATUS HAVING IMPROVED MECHANISMS FOR EXTENDING AND RETRACTING OPERATING FLEXIBLE HOSE

George Vernon McGaha, Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 12, 1976, Ser. No. 741,384

Int. Cl.[2] A61C *19/02*

U.S. Cl. 32—22 **9 Claims**



8. Stop devices, such as for use with extending and retracting mechanisms for flexible hose connected to dental or medical treatment instruments, comprising:

ratchet wheel means mounted for rotation in one direction, for example upon extension of the flexible hose, and for rotation in the other direction, for example upon retraction of the flexible hose;

means biasing said ratchet wheel for rotation in the other direction;

pawl means mounted for pivotal movement by gravity into engagement with said ratchet wheel means for preventing rotation of said ratchet wheel means in the other direction under the influence of said biasing means, said pawl means being held in engagement with said ratchet wheel means by frictional contact therebetween under the bias of said ratchet wheel biasing means; and

selectively actuatable means associated with said pawl means for biasing and holding said pawl means against gravity out of engagement with said ratchet wheel when actuated and for allowing said pawl means to move by gravity into engagement with said ratchet wheel when deactuated, said selectively actuatable means being responsive to rotation of said ratchet wheel in the one direction for a predetermined timed period for deactuation therof for a predetermined timed period and for actuation thereof after the predetermined timed period;

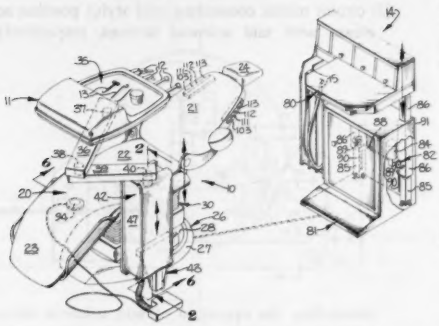
whereby, said pawl means will drop into engagement with said ratchet wheel for a predetermined timed period upon rotation of said ratchet wheel in the one direction and will be held by friction in engagement therewith against the bias of said pawl biasing means if rotation of the ratchet wheel in the one direction is relased during such predetermined timed period, such as for example to lock the flexible hose in a desired extended position upon release of the hose in a desired extended position, and said pawl means will be moved out of engagement with said ratchet wheel means by said pawl biasing and holding means upon failure to release rotation of said ratchet wheel means in the one direction during the predetermined timed period or upon a slight movement of said ratchet wheel means in the one direction to break the frictional engagement of said pawl means and said ratchet wheel means, such as for example to allow retraction of the flexible hose.

4,114,274

MOVABLE POWER-OPERATED INSTRUMENT CONSOLE AND TREATMENT CHAIR APPARATUS

Arthur Lee Jones, Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 12, 1976, Ser. No. 741,381
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 13 Claims



1. Movable, power-operated, instrument console and treatment chair apparatus characterized by being selectively individually or simultaneously movable to desired positions for patient treatment; said apparatus comprising:

a treatment chair having an occupant supporting assembly, a base assembly, and an elevator assembly connected to and between said occupant supporting assembly and said base assembly for raising and lowering said occupant supporting assembly;

drive means connected with said treatment chair elevator assembly for operating same;

an instrument console having a tray assembly for carrying instruments and the like, a base assembly, and an elevator assembly connected to and between said tray assembly and said base assembly for raising and lowering said tray assembly;

drive means connected with said instrument console elevator assembly for operating same; and

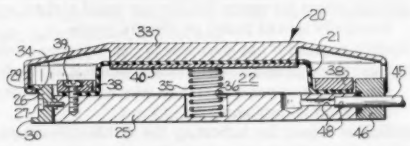
control means connected with said chair drive means and said console drive means for selectively (1) simultaneously operating both of said drive means for simultaneous raising or lowering of said treatment chair occupant supporting assembly and said instrument console tray assembly, or (2) independently operating each of said drive means for independent raising or lowering of said treatment chair occupant supporting assembly and said instrument console tray assembly.

4,114,275

FOOT CONTROLLER APPARATUS FOR AIR DRIVEN DENTAL HANDPIECES OR THE LIKE

Arthur Lee Jones, and Dennis Frank Leffler, both of Charlotte, N.C., assignors to Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 12, 1976, Ser. No. 741,383
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 9 Claims



1. Foot controller apparatus for manually controlling the flow through a supply line to a dental handpiece or the like and being characterized by a construction providing for remote foot control by a minimum size foot pedal device of the flow through the supply line to a handpiece without the necessity of bulky compressed air lines passing through the foot pedal device or the incorporation of complicated electrical or mechanical mechanisms in the foot pedal device; said foot controller apparatus comprising:

a foot pedal device of minimum size for easy contact by the foot of an operator of the dental handpiece and comprising a base member having a lower surface portion for resting on a floor, an upper member of generally shallow inverted cup-shaped configuration for being positioned over and around said base member for forming with said base member a hollow cavity within said foot pedal device, retaining means for retaining said upper member on said base member while allowing upward and downward movement of said upper member relative to said base member, biasing means positioned between said upper member and said base member for biasing said base member upwardly while allowing depression of said upper member relative to said base member, and a diaphragm member secured around its periphery to said base member and being attached to said upper member for movement therewith and extending over and closing said cavity within said foot pedal device to form a fluid sealed chamber which reduces in volume upon depression of said foot pedal device;

an elongate tube of small cross-sectional dimensions being connected at one end thereof with said foot pedal device and communicating with said fluid sealed chamber for conveying a flow of fluid therethrough resulting from operation of said foot pedal device; and

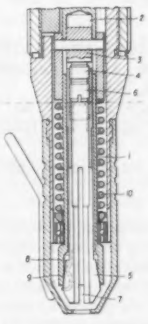
fluid-responsive means for being positioned away from said foot pedal device to avoid interference with the operator of the dental handpiece and operatively connected with the supply line and with the other end of said fluid tube for being operated by the flow of fluid through said fluid tube resulting from foot operation of said foot pedal device for controlling the flow through the supply line to the dental handpiece.

4,114,276

DENTAL TOOL HANDPIECE ASSEMBLY WITH REMOVABLE SPACER MEMBER

Peter Malata, and Josef Buchsteiner, both of Bürmoos, Austria, assignors to Dentalwerk Bürmoos Gesellschaft m.b.H., Bürmoos, Austria

Filed May 5, 1977, Ser. No. 794,332
Claims priority, application Austria, May 6, 1976, 3328/76
Int. Cl.[2] A61C *1/14*
U.S. Cl. 32—26 8 Claims



1. A dental tool handpiece assembly comprising a collet defining a bore into which a tool member is inserted, said collet

being formed with longitudinal slots adapting said collet to grip said tool for operative engagement within said handpiece assembly, said bore being defined with a predetermined depth terminating interioraly of said assembly at a tool abutment surface located to be engaged by the inner end of a tool inserted into said bore, and a removable spacer member inserted into said bore to provide a substitute tool abutment surface thereby to adapt said handpiece assembly to receive a tool having a length which does not reach to said tool abutment surface when said tool is in operative engagement within said bore, said removable spacer member including a handle portion located to extend outwardly of said bore and to within one of said collet slots when said spacer member is in place within said bore.

4,114,277

METHOD OF FITTING A GARMENT

Betty B. Chalker, 3650 Sulene Dr., College Park, Ga. 30349

Filed Aug. 12, 1976, Ser. No. 713,677
Int. Cl.[2] A41H *3/00*
U.S. Cl. 33—14 **2 Claims**

1. The method of fitting a garment to a particular person wherein said garment includes a contoured portion having a maximum perimeter and said person includes a contoured portion having a maximum perimeter substantially of such size as to receive said contoured portion of said garment, said garment being a pair of pants having a crotch seam, said method including the steps of defining a first reference line on said person at the waist of said person, defining a second reference line on said person at said maximum perimeter, said second reference line being generally on the hips of said person, determining the distance between said first reference line and said second reference line to determine the hip length, and selecting an inset for extending said crotch seam based on said hip length, the step of extending said crotch seam based on said hip length comprising the steps of providing an inset by measuring the length of half the back of said person at said second reference line, and making said inset with a crotch seam extension equal to 40% of said length of half the back.

4,114,278

TRACER APPARATUS

Arthur Ernest Laws, St. Albans, England, assignor to Trubenised (Sales) Limited, England

Filed Feb. 9, 1977, Ser. No. 767,210
Int. Cl.[2] B23Q *35/28;* **H02P** *7/38*
U.S. Cl. 33—23 K **6 Claims**

1. Tracer apparatus for tracing the periphery of a template pattern, comprising

(a) a base (B);

(b) a template (1) containing a template pattern;

(c) template mounting means (3) supporting said template for coplanar displacement relative to said base;

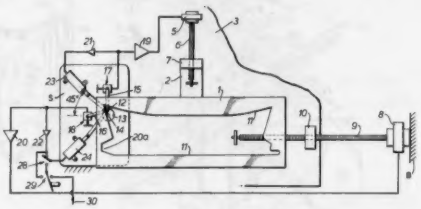
(d) stylus means (12) movably connected with said base for engagement with the periphery (11) of the template pattern, said stylus means normally having a first position relative to said base;

(e) means for displacing one end of said stylus means along a circular search path concentrically arranged about said first stylus position, said stylus displacing means including

(1) at least two solenoid devices (23,24) connected between said base and said stylus means, said solenoid devices being angularly arranged relative to said stylus means;

(2) at least two stylus position sensing means (17,18) for sensing the instantaneous position of said stylus means relative to said first position; and

(3) circuit means connecting said stylus position sensing means with said solenoid devices, respectively, for



controlling the operation of said solenoid devices to apply to said stylus means a force having a component perpendicular to the direction of displacement of said stylus means from said first stylus position; and

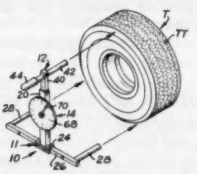
(f) means operable by said sensing means when said stylus is in engagement with a given location on the periphery of the template pattern for displacing said template mounting means in a direction parallel with the line extending between said given pattern location and said normal first stylus position, whereby said template is displaced to cause the stylus to trace the entire periphery of the template pattern.

4,114,279

TIRE CORRECTION SYSTEM

Winston O. Johnson, 3379 Aztec Rd., 22D, Doraville, Ga. 30084, and Jerry A. Crabb, 320 White Oak Dr., Buford, Ga. 30518

Filed Oct. 29, 1976, Ser. No. 737,018
Int. Cl.[2] G01B *5/08;* **G01M** *17/02*
U.S. Cl. 33—178 R **7 Claims**



1. A device for measuring inflated vehicular tires to provide a reading indicative of tire tread diameter and/or circumference length comprising:

contact means for contacting the tire tread at three circumferentially spaced points on the tire tread;

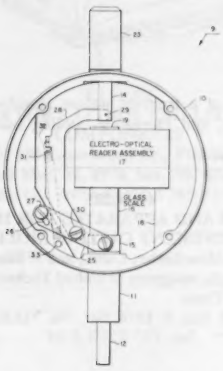
loading means for applying a load per unit area to the tire tread through said contact means which is approximately the actual load per unit area to which the tire is subjected during actual use; and,

indicator means for indicating the distance between some point on a line joining two of said spaced points and the other of said spaced points.

4,114,280
DIGITAL ELECTRONIC INDICATOR

David W. Rucinski, Rochester, N.Y., assignor to Quality Measurement Systems, Inc., Penfield, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,506
Int. Cl.[2] G01B 5/20; H01J 3/38
U.S. Cl. 33—172 E 8 Claims



1. An indicator having a spindle with a substantial travel of at least about ½ inch and having a generally cylindrical housing meeting current Americal Gauge Design dimension requirements for diameter, spindle bushing, and back mounting plate, said indicator comprising:

a. a coupling secured to the inner end of said spindle within said housing to be movable directly with said spindle;

b. a ruled glass scale secured to said coupling for direct movement with said spindle in a region within said housing axially offset from the region of movement of said spindle;

c. a reader assembly mounted in said housing so that said scale is movable relative to said reader assembly to produce moire fringes that are electro-optically detected by said reader assembly;

d. a digital display cooperatively responsive to said reader assembly for indicating positions of said spindle relative to said housing;

e. a connecting arm secured to said coupling for movement in a region spaced from said movement region of said scale;

f. a lifter rod arranged diametrically opposite said spindle and coaxial with said spindle in a position spaced from said movement region of said scale;

g. a lifter arm connected to said lifter rod and to a midregion of said connecting arm and movable in a region spaced from said movement region of said scale so that movement of said lifter rod is transmitted through said lifter arm and said connecting arm to amplify movement of said spindle; and

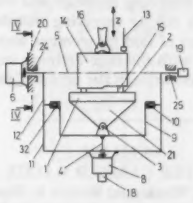
h. a spring arranged for biasing said spindle outward from said housing.

4,114,281
METHOD OF AND DEVICE FOR CLAMPING A WORKPIECE

Rudolf Pavlovsky, Schaffhausen, and Heinz Wüest, Sonnenberg, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 25, 1977, Ser. No. 771,948
Claims priority, application Switzerland, Mar. 2, 1976, 2600/76
Int. Cl.[2] G01B 5/00
U.S. Cl. 33—180 R 15 Claims

1. Method of locating a workpiece in position to be worked, especially for the mechanical working of a workpiece in the form of a rough or undressed casting, comprising the steps of mounting a movably displaceable support surface for pivotal movement about three separate spaced axes, clamping the workpiece on the movably displaceable support surface, measuring the deviation of a surface on the workpiece from a

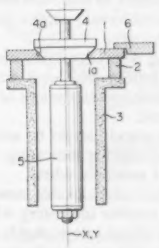


nominal position in at least two spaced locations, and adjusting the support surface based on the measured deviations for eliminating the deviations of the surface on the workpiece from the nominal position by rotatably moving the support surface together with the clamped workpiece about at least one of its three separate spaced axes.

4,114,282
VERTICAL CENTERING METHOD AND JIG FOR PLATING

Yoshio Hane, Kawasaki; Nobuo Chino, Komae; Katsuhiro Murata, and Akira Harayama, both of Okaya, all of Japan, assignors to Taisei Kensetsu Kabushiki Kaisha and Teikoku Piston Ring Co., Ltd., both of, Japan

Filed Mar. 22, 1976, Ser. No. 669,453
Claims priority, application Japan, Apr. 14, 1975, 50-44233
Int. Cl.[2] G01B 3/30
U.S. Cl. 33—180 R 4 Claims



1. A method for centering a cylindrical member to be plated within a hollow vertically arranged cylindrical plating electrode so that the longitudinal axis of the cylindrical member to be plated is aligned with the vertical axis of the cylindrical plating electrode, which method comprises:

securing on the top of the vertical plating electrode a horizontal jig receiving member having a circular hole therein, said hole being defined by a surface tapering downwardly and inwardly toward the vertical axis of the cylindrical plating electrode, arranging said hole so that the geometric center is aligned with a longitudinal axis within said electrode;

securing on one end of the cylindrical member to be plated a disc-shaped jig member having a tapering peripheral surface engagable in tight mating fit with the circular hole-defining surface; with said disc-shaped jig member being perpendicular to the longitudinal axis of the cylindrical member to be plated, said hole-defining surface and said tapering peripheral surface having a shape for fixing the disc-shaped jig member horizontally in said jig receiving member when said surfaces are in tight mating fit;

inserting said cylindrical member to be plated into the hol-

low interior of the cylindrical plating electrode with said jig member gravitationally suspending said cylindrical member within said electrode in such a manner that the peripheral surface of said jig member is brought into provisional imperfect engagement with the hole-defining surface of the jig receiving member; and

vibrating said jig receiving member and vibrating said jig member through the jig receiving member to bring the peripheral surface of said jig member into said tight mating engagement with the hole-defining surface of said jig receiving member through the effect of said gravitational suspension.

4,114,283

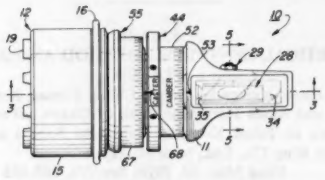
CASTER CAMBER GAUGE

Phillip A. Spainhour, Waukegan; Robert S. Hampton, Jr., Skokie, and Leonard A. Morrison, Chicago, all of Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.

Continuation of Ser. No. 619,512, Oct. 3, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,226

Int. Cl.[2] G01B 5/255, 13/195

U.S. Cl. 33—337 **5 Claims**



1. An instrument for measuring the camber and caster angles of a steerable wheel, comprising

a carrier for attachment to said steerable wheel,

a spirit level mounted to said carrier for pivotal movement about a horizontal axis,

a camber indicating wheel rotatably carried by said carrier for pivotally adjusting said level and for indicating the angle of incidence between the axis of said steerable wheel and the horizontal,

a caster indicating wheel carried by said carrier for coaxial rotation with said camber indicating wheel for indicating the caster of said steerable wheel,

first indicating wheel interlockable means carried at a fixed position on said camber indicating wheel,

second indicating wheel interlockable means carried at a fixed position on said caster indicating wheel, and

said first and second interlockable means being movable into mutual interlocking relationship only when said indicating wheels are in one relative angular position wherein said fixed positions are mutually adjacent.

4,114,284

SACHETS PARTICULARLY FOR USE IN CLOTHES DRIERS

Rudolf Weber, Dusseldorf-Holthausen; Winfried Pochandke, Dusseldorf-Garath, and Karl Schwadtke, Opladen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

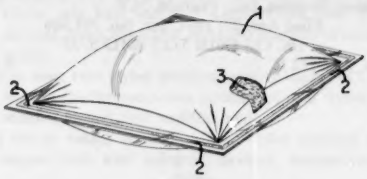
Filed Jan. 25, 1977, Ser. No. 762,254

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603823

Int. Cl.[2] F26B 7/00

U.S. Cl. 34—12 **9 Claims**

1. The method of drying and scenting damp washed laundry consisting of mechanically tumbling the same in an enclosed zone while passing hot air therethrough at a temperature of from 35° C. to 100° C. for a time sufficient to dry the same in the presence of a sachet consisting of a closed packet of a semi-permeable-to-gas polyethylene film having a greater permeability to gas at temperatures in the range of 35° C. to 100° C., than lower temperatures, containing an odor-producing composition of a fragrant nature absorbed on an inert absorbent carrier, and thereafter cooling said hot dry and scented laundry.



4,114,285

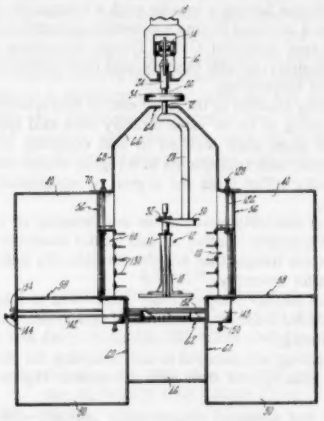
METHOD AND APPARATUS FOR DRYING INVESTMENT CASTING MOLDS

Carlton E. Cruff, Manchester, Conn., and William E. Harrison, Royal Oak, Mich., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 9, 1976, Ser. No. 713,025

Int. Cl.[2] F26B 3/04

U.S. Cl. 34—29 **13 Claims**



1. In the formation of investment casting molds, a method for drying a layer of ceramic slurry which has been applied to patterns of the article to be cast comprising the steps of:

(a) conveying the coated patterns through a series of individual drying stations;

(b) directing drying air of controlled quality, including controlled wet bulb temperature, dry bulb temperature and velocity, across the patterns at a sufficient number of stations to effect drying including:

(1) initially employing drying air of a quality especially suited to effect rapid removal of a majority of the moisture from the slurry layer, said drying air having a wet bulb temperature about equal to the initial pattern temperature, a dry bulb temperature at least 10° above the wet bulb temperature and a velocity across the patterns of at least 400 feet per minute, said drying air being employed until harmful increases in pattern temperature are likely to occur as a result of a reduction in the kinetics of moisture removal from the slurry layer; (2) then employing drying air of a different quality to remove the remaining moisture from the layer, the quality of said air being specially adapted to prevent harmful increases in pattern temperature due to the reduced

moisture removal kinetics of the layer and differing from that used in initial drying by having, singly or in combination, a reduced wet bulb temperature, reduced dry bulb temperature and increased velocity;

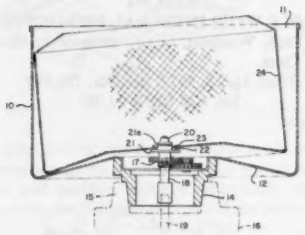
(c) exhausting the drying air in the vicinity of each drying station after said air passes over the coated patterns and before said air adversely affects drying air of controlled quality at other stations.

4,114,286

DRYERS FOR LETTUCE AND LIKE SALAD COMPONENTS

Lowell Bingham, 130 Laurelwood Dr., Pittsburgh, Pa. 15237

Filed Mar. 31, 1976, Ser. No. 672,422
Int. Cl.[2] A47J *43/04*; F26B *11/08*
U.S. Cl. 34—58 **5 Claims**



1. In combination a lettuce and like dryer consisting essentially of a conventional blender apparatus having a vertical shaft, an outer imperforate basket having a top opening and a bottom with a generally annular peripheral reservoir collecting moisture discharged from said lettuce, and an axial opening engaging means at the bottom opening engaging the housing of said conventional blender, an inner axial stub shaft connected to gear drive means mounted in said bottom opening, said drive means engaging the drive shaft of said conventional blender and perforate basket means coaxial within said outer basket and freely removable through the top opening adapted to receive lettuce and the like to be dried and to hold the same spaced from moisture collected in the annular reservoir, said perforate basket freely pivotably, and removably engaging said stub shaft to be driven thereby, said stub shaft being provided with a spider having upwardly extending vertical fingers freely engaging openings in the bottom of the perforate inner basket means permitting the basket to tilt relative to said fingers in response to load imbalance to provide a visual imbalance indicator.

4,114,287

ACID RESISTANT FREEZE DRYING TRAP

Douglas S. Fraser, New Paltz, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.

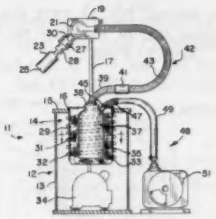
Filed Jan. 24, 1977, Ser. No. 761,471
Int. Cl.[2] F26B *13/30*; B01D *5/00*
U.S. Cl. 34—92 **11 Claims**

9. For use in a freeze drying system, a vacuum condenser including:

a pot;

a condensing trap having a condensing surface, said condensing trap being removably disposed within said pot; and,

a plurality of randomly disposed surfaces of a highly thermally conductive material formed in a mesh for transfer-



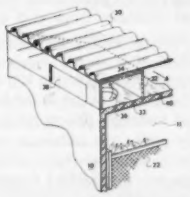
ring thermal energy between said pot and said condensing surface.

4,114,288

BULK CURE TOBACCO BARN WITH IMPROVEMENTS IN CONSTRUCTION FOR OPTIMIZING HEATING EFFICIENCY

Joe W. Fowler, Iron Works Rd., Rte. 2, Box 39, Reidsville, N.C. 27320

Filed Oct. 14, 1976, Ser. No. 732,481
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—93 **12 Claims**



1. An apparatus for the bulk curing of tobacco by means of hot air which is circulated through the tobacco leaves to remove the moisture therefrom comprising:

(a) a substantially air tight, insulated curing chamber having a furnace chamber positioned separate from, but adjacent one end thereof, a furnace therein, and a heated air ingress from said furnace chamber to said curing chamber, said furnace chamber being otherwise isolated from said curing chamber, and a means for supporting the tobacco in said curing chamber with an air space above and below;

(b) outlet means for said curing chamber through which a portion of the air from inside said chamber is exhausted;

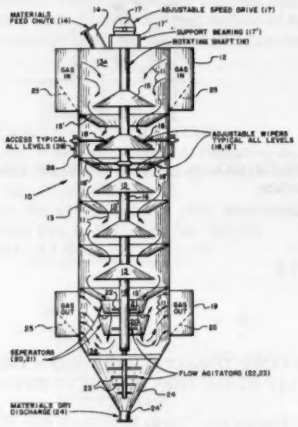
(c) a fresh air inlet means communicating with said furnace through which fresh, generally drier air is brought for treatment by said furnace before introduction as a replacement for the air exhausted from said chamber; and

(d) heat exchange means connecting said fresh air inlet and said furnace, and including a first air passage between said fresh air inlet means and said furnace and at least one second air passage between said outlet means and the atmosphere through which said exhaust air passes, said first and second air passages lying adjacent each other and separated by a heat conducting material having substantially high heat transfer properties.

4,114,289
DRYER SYSTEM

William Paul Boulet, 4945 St. Roch Ave., New Orleans, La. 70122

Division of Ser. No. 549,945, Feb. 14, 1975, Pat. No. 3,976,018.
This application Jun. 29, 1976, Ser. No. 700,809
Int. Cl.[2] F26B *17/12*
U.S. Cl. 34—173 8 Claims

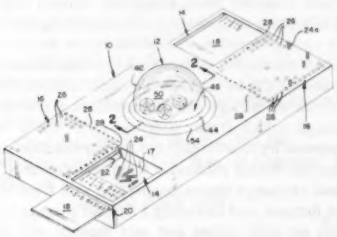


1. A vertical dryer system for solid materials comprising:
an elongated, at least generally vertically disposed, hot gas/materials interaction drying chamber;
a gas inlet at one end of said chamber and a gas outlet at the other end of said chamber, structural conduction means for conducting the hot gases being conducted through the length of said chamber from said gas inlet to said gas outlet in at least generally uniform, evenly distributed, non-vortex flow; and
a solid "wet" materials inlet at the top of said chamber and a solid "dry" materials outlet at the bottom of said chamber, said solid materials falling through said chamber at least partially under the influence of gravity from said materials inlet to said materials outlet, said hot gases and said solid materials intermixing together in said chamber, drying said solid materials.

4,114,290
ARITHMETIC DICE GAME

James B. Cooper, 627 Main, Apt. A, Vallejo, Calif. 94590

Filed Jul. 26, 1976, Ser. No. 708,841
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 R 4 Claims

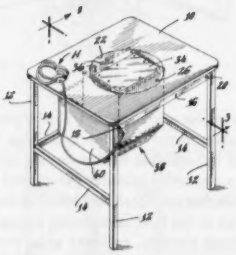


1. An improved game device for aiding in the learning of certain arithmetic tables comprising:
a. a game board having at least two dice with faces having numeric indicia on said faces, and an additional die having at least one arithmetic operant from the group of add, subtract and multiply,
b. means mounted on said game board for containing and reorienting said dice comprising a transparent hemispherical shell, a leaf spring over which said shell is mounted, the shell and leaf spring defining an enclosure within which said dice are contained, said leaf spring being abruptly deformable by pressing and releasing said shell, wherein the orientation of said dice on said support surface are changed,
c. a plurality of holes in a portion of said game board uniformly arranged in a defined scoring field wherein said holes are arranged in rows and columns, said rows and columns each being identified by sequential numerical indicia,
d. a plurality of associated pegs, said pegs being constructed for placement in said holes for scoring indicia, and,
e. receptacle means on said game board for storing said plurality of associated pegs.

4,114,291
TABLE WITH INTEGRAL PROJECTOR

Herman P. Taub, Westport, Conn., assignor to Mediax, Inc., Westport, Conn.

Filed Apr. 6, 1977, Ser. No. 785,199
Int. Cl.[2] G09B *11/00*
U.S. Cl. 35—36 8 Claims



1. In a table for use in teaching motor skills including a top and supporting legs, the improvement which comprises: a disk insert in said top rotatable relative thereto about an axis normal to said top, said insert having a translucent portion therein; means mounted below said top for supporting an optical projector positioned to direct an image onto said translucent portion, said projector support means being rotatable with said disk insert relative to said top; and means for retaining a worksheet on the upper surface of said translucent portion in registry with said image.

4,114,292
MATCH UP GAME

Stanley E. Smith, Gladwin, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 26, 1977, Ser. No. 827,863
Int. Cl.[2] G09B *7/10*
U.S. Cl. 35—9 B 1 Claim

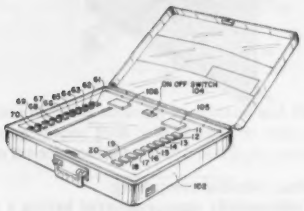
1. A match up game for answering questions from multiple choice answers and indicating the correctness and incorrectness of the answers, said match up game comprising
a list of questions and multiple choice answers for each of the questions, the questions being numbered to distinguish them from each other and the answers being numbered to distinguish them from each other;
a plurality of rotary switches each having a plurality of electrical contacts and a rotary switch arm, each of the rotary switches being set with its switch arm in electrical contact with a selected one of its electrical contacts in

accordance with the correct answer to a corresponding question;

a plurality of question switches numbered in correspondence with the question, each switch having a first contact electrically connected to one of the electrical contacts of each of the rotary switches and a second contact;

a plurality of answer switches numbered in correspondence with the answers each having a first center electrical contact electrically connected to the rotary switch arm of a corresponding one of the rotary switches, a first electrical contact and a second electrical contact;

a source of electrical energy having a first polarity terminal electrically connected in common to the second contacts of the question switches and a second polarity terminal;



a green lamp having one terminal electrically connected to the second polarity terminal of the source of electrical energy and another terminal electrically connected in common to the second contacts of the answer switches; and

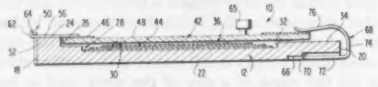
a red lamp having one terminal electrically connected to the second polarity terminal of the source of electrical energy and another terminal electrically connected in common to the first contacts of the answer switches whereby when the correct answer is selected via the corresponding answer switch the green light is energized and when an incorrect answer is selected the red light is energized.

4,114,293

FRAME FOR FACIAL IDENTIFICATION SYSTEM WITH COMPONENT RESERVOIR

William T. Quinn, III, 681 Park Ave., Freehold, N.J. 07728

Filed Sep. 9, 1977, Ser. No. 832,045
Int. Cl.[2] G09B *1/30*
U.S. Cl. 35—28 **3 Claims**



1. In a facial identification system comprising a composite of facial features interrelated to form a representation of a subject, the composite being made up of changeable individual feature component segments which partially overlap one another in irregular layered fashion, a holder for the assembled, partially overlapped segments comprising:

a base member having a planar lower surface, side edges, top and bottom edges, and upper surfaces;

said upper surfaces of said base member including an elevated hinge ledge adjacent one of said side edges, a depressed reservoir surface of a depth and extent to accommodate said assembled, partially overlapped segments, and a cover rim support surface of a height intermediate that of the hinge ledge and the reservoir;

a transparent cover plate moveably mounted for disposition over the central holder surface, and bearing against the cover rim support surface; and

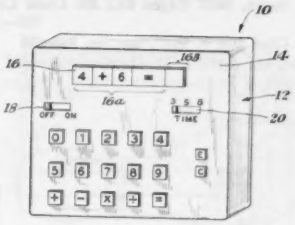
releasable clamp means for maintaining said cover plate in position.

4,114,294

ARITHMETIC TEACHING DEVICE

Melvin Marmer, 10531 NW. 24th Ct., Sunrise, Fla. 33322

Filed Apr. 7, 1975, Ser. No. 565,669
Int. Cl.[2] G09B *9/00, 19/02*
U.S. Cl. 35—31 C **1 Claim**



1. A teaching device for teaching the solution to arithmetic problems comprising:

an electronic arithmetic calculating means;

a keyboard having a plurality of numerical keys and operatives connected to said arithmetical calculating means for formulating arithmetical problems;

a numerical indicia display panel having a first display portion and a second display portion, said first display portion being connected to and actuated by said keyboard for displaying particular numerals and the operative of a particular arithmetic problem, said second display portion disposed adjacent said first display portion;

means for actuating said arithmetic calculating means for solving arithmetic problems coupled to said keyboard; and

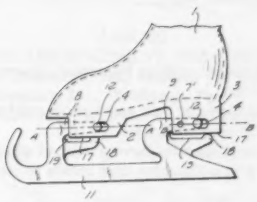
an adjustable, numerical indicia time delay circuit connected between said arithmetic calculating means and said second display portion for delaying the display of the second display portion representative of an answer received from the arithmetic calculating means.

4,114,295

CONVERTIBLE SPORTS SHOE

Hans-Joachim Schaefer, Gymnasiumstr. 7, D-6380 Bad Homburg, Fed. Rep. of Germany

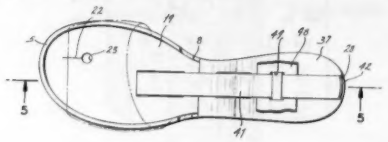
Filed May 5, 1977, Ser. No. 793,840
Int. Cl.[2] A43B *3/24, 5/04*
U.S. Cl. 36—100 **18 Claims**



1. A shoe sport arrangement, comprising a shoe body having a sole integrally connected to said show body; a plurality of different sports devices, each adapted for use in a different sport, and means for interchangeable mounting a selected one of said devices on said sole, including cooperating projections and recesses provided on each of said devices and said sole, respectively, for detachably connecting a selected one of said sport devices to said shoe body, and elongated bores in com-

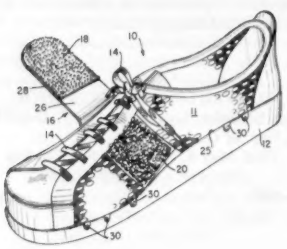
munication with said recesses and each extending transversely of said recesses, said projections being partly extendable into said bores so as to permit dislodging of the sports devices by urging the projections lengthwise of the respective recesses by applying pressure on the recesses through the bores and in direction lengthwise of the sole.

4,114,296
INTERCHANGEABLE SANDAL
Gardner M. Smith, 9027 Eager Rd., St. Louis County, Mo. 63144
Filed Jun. 6, 1977, Ser. No. 803,658
Int. Cl.[2] A43B *3/24, 13/08, 13/38, 3/12*
U.S. Cl. 36—101 **11 Claims**



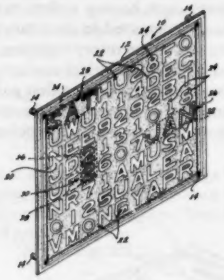
1. An article of footwear comprising an outsole of unitary molded construction having a forward portion and a rearward heel portion, there being a transversely extending, upwardly opening depression between said forward and rearward outsole portions constituting a zone of flexure, said depression comprising transversely extending first and second inclined surfaces, and upper-defining means detachably mounted on said outsole.

4,114,297
CINCHING CLOSURE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Apr. 27, 1977, Ser. No. 791,551
Int. Cl.[2] A43B *11/00*
U.S. Cl. 36—50 **1 Claim**



1. Athletic footwear with an improved closure, comprising
(a) a unit bottom;
(b) an upper adhered to said unit bottom, said upper having a laceable closing portion;
(c) a closure cinching strap having one end connected to said upper and a first fastening tape means secured to its free end;
(d) said connected end of said cinching strap extending from instep portions of said upper;
(e) said cinching strap being sandwiched between said upper and said bottom in the area of the arch;
(f) said cinching strap being stitched directly to said upper adjacent the arch;
(g) anchoring fastening tape means on said upper at the side opposite to said connected end;
(h) said first fastening tape means and said anchoring fastening means being hooked and looped "Velcro"-type strips.

4,114,298
PERPETUAL CALENDAR
Robert L. Sandelman, 2112 E. Hillhaven Dr., Brea, Calif. 92621
Filed May 2, 1977, Ser. No. 792,855
Int. Cl.[2] G09D *3/00*
U.S. Cl. 40—110 **9 Claims**

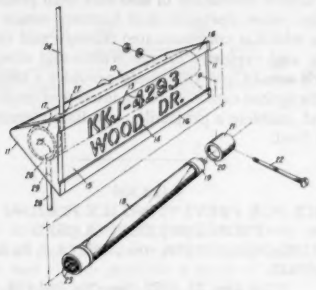


1. A perpetual calendar comprising:
a sheet of substantially opaque material having a predetermined matrix arrangement of transparent letters and numerals thereon for predetermined random horizontal and vertical display of abbreviations for each month of the year and the name of each day of the week defined within the matrix by successive groups of said letters and each numerical day of the month from one to thirty-one being defined within the matrix by a single numeral or two successive numerals;
a first piece of substantially opaque material of a color contrasting to said opaque sheet and having means whereby it can be affixed to said sheet, and sized to overlie a successive group of letters within the matrix on said sheet defining an abbreviation for a month of the year;
a second piece of substantially opaque material of a color contrasting to said opaque sheet and having means whereby it can be affixed to said sheet, and sized to overlie a successive group of letters within the matrix of said sheet defining an abbreviation for the name of a day of the week;
at least a third piece of substantially opaque material of a color contrastive to said opaque sheet and having means whereby it can be affixed to said sheet, and sized to overlie at least one numeral within the matrix on said sheet; and
wherein at least a portion of the abbreviations for months of the year within the matrix share a letter in the matrix with another abbreviation for a month of the year, at least a portion of the abbreviations for the names of the days of the week share a letter in the matrix with another abbreviation for the name of a day of the week, and at least a portion of the numerals between **10** and **31** share one numeral in the matrix with another numeral between **10** and **31**.

4,114,299
RADIATION POWERED ILLUMINATED DISPLAY
Theodore Brownlee, Apt. K-4, 2200 Godby Rd., College Park, Ga. 30349
Filed Jun. 10, 1976, Ser. No. 694,702
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—545 **20 Claims**

1. An illuminating display for an automobile for indicating when a radio transmitter is being used, comprising: an upstanding transmitting antenna, a housing having an indicia display panel, a light source disposed within said housing, means on said housing for securing said housing to said antenna intermediate the ends of said antenna, said housing being supported by

said antenna, said housing projecting sidewise from said antenna, said light source being of the type which is energized and lighted by radio frequency radiation, one end of said light



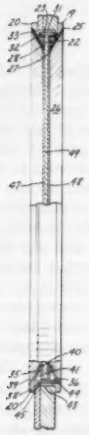
source being disposed adjacent to antenna and the other end thereof being spaced from said antenna so that said antenna constitutes the sole means by which said light source is lighted.

4,114,300

PHOTO ALBUM COVER WITH FRAMED INSERTS

Sheldon Holson, Norwalk, N.Y., assignor to The Holson Co., Wilton, Conn.

Filed Feb. 16, 1977, Ser. No. 768,992
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—152 **5 Claims**



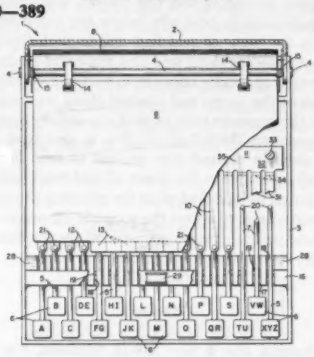
1. In a combination photo album cover and frame engaged therewith, said cover having a principal plane and comprising a plurality of laminated layers, said cover having a through opening extending perpendicular to the plane thereof of given size and configuration, and having outer and inner planar surfaces, the improvement comprising: said frame element including first and second mating frame elements inserted into said opening from first and second sides thereof to mutually engage and present further axial movement thereof with respect to said opening; each of said first and second frame elements having a peripherally disposed inwardly facing surface forming part of a clamping means cooperating with the corresponding surface on the other of said frame elements; whereby upon the positioning of a correspondingly configured photograph within said through opening, and the insertion and engagement of said first and second frame elements, said photograph may be clamped against movement at the peripheral areas thereof between said inwardly facing planar surfaces.

4,114,301

INDEXING DEVICE

Chuzo Mori, Tateishi, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1976, Ser. No. 736,949
Claims priority, application Japan, Oct. 31, 1975, 50-131919
Int. Cl.[2] B42F *13/00*
U.S. Cl. 40—389 **10 Claims**



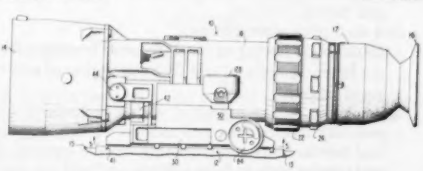
1. An indexing device comprising:
(a) a base,
(b) a lid pivoted to the base,
(c) a plurality of cards pivotally mounted between the lid and the base for selective movement with the lid, each card having a lug at a front edge thereof, the plurality of cards being arranged such that the lugs are serially positioned at specific intervals in step-wise fashion,
(d) a like plurality of levers pivoted to the base at corresponding specific intervals, a first end of each lever having a push-button fixed thereto for downward digital manipulation and the opposite end of each lever extending under the front edge of the cards for upward movement to select a desired number of cards to pivot upward with the lid, and
(e) a plurality of intermediate arms, one intermediate arm positioned between each of the levers and each of the corresponding lugs on the cards for amplifying the motion of the levers, one end of each intermediate arm being fixed to the base, the other end of each intermediate arm being positioned under a selected one of said lugs, and said opposite end of each lever contacting the underside of a corresponding intermediate arm approximately midway between its ends.

4,114,302

MOUNTING ARRANGEMENT FOR A RIFLE SCOPE

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.

Filed Jun. 13, 1977, Ser. No. 806,248
Int. Cl.[2] F41G *1/38*
U.S. Cl. 42—1 ST **13 Claims**



1. An arrangement for mounting a rifle scope having a cylindrical body portion on a rifle barrel comprising:

a base including first and second substantially side-by-side coplanar plates, means for pivotally securing said plates one to the other for movement of said first plate relative to said second plate in a generally horizontal direction about a first axis generally normal to the plane containing said plates;

means for moving said first plate relative to said second plate for adjusting the angular relation between said plates;

an elongated mounting foot carried by said second plate on the side thereof remote from said first plate for mounting the scope on top of the rifle barrel, said mounting foot lying substantially centrally below the scope and substantially in the plane of said first and second plates;

a saddle upstanding from said first plate and having an arcuate portion generally concentric with the cylindrical body portion of the scope and located along its underside;

means at the opposite ends of said arcuate portion for pivotally mounting the scope relative to said base for movement about a second axis normal to said first axis and generally parallel to the plane of said base; and

means carried by said first plate for pivoting the scope about said second axis to adjust the scope in elevation relative to said base, said elevation adjustment means being located laterally of the scope and above said base.

4,114,303

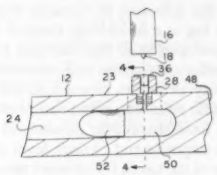
MUZZLE LOADING FIREARM

James C. Vaughn, Rte. 4, Box 348-D, Madison, Ala. 35758

Filed Aug. 12, 1977, Ser. No. 823,996

Int. Cl.[2] F41C *27/00*

U.S. Cl. 42—51 **2 Claims**



1. A muzzle loading firearm comprising:

a firearm barrel having a breech region through which there is an opening running from exterior to interior of the barrel, and the interior wall of at least an outer end region of said opening being threaded;

an elongated tube having;

an opening extending longitudinally through said tube, said opening being circular and enlarged in diameter in a first end region when compared with the inner diameter of the opposite, or second, end region of said opening,

said tube terminating in a plane surface at one end adjacent to said first end region, which plane surface lies generally normal to the direction of said opening, and

the outside region adjacent to the opposite, or second, end of said tube being of smaller diameter than said first-named end of said tube, and having an external thread adapted to mate with said interior threaded opening in said barrel;

a shot shell primer comprising:

a tubular body having an outer diameter corresponding to the inner diameter of said first end region of said elongated tube,

an explosive charge contained within said tubular body,

a generally flat, circular end member closing one end of said tubular body and extending radially outward from said tubular body to form a flange, and said end member including a central membrane adapted to communicate a firing force to said explosive charge when struck, and

said tubular body is positioned within said first end region of said elongated tube with said flange resting against said plane surface of said elongated tube; and

spring loaded hammer means supported by said barrel, and including a protrusion for applying a small area force to said central membrane of said shot shell primer;

whereby, when operated, said hammer means provides a force which is communicated through said membrane to ignite said explosive charge within said elongated tube, which tube in turn effectively provides a single exit path for the ignited explosive to the interior of the breech of the barrel, enabling a projectile propellant therein to be reliably fired.

4,114,304

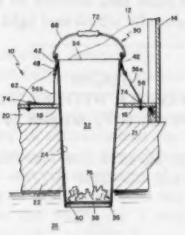
DEVICE FOR PREVENTING ICE FISHING HOLES FROM FREEZING CLOSED

Richard C. Hedlund, 142-17th Ave., NE., (Apt. 4), Minneapolis, Minn. 55413

Filed Jan. 27, 1977, Ser. No. 762,976

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—4 **7 Claims**



1. A device for preventing ice fishing holes from freezing closed comprising a tapered tubular casing of sheet metal having an open upper end enabling combustible materials to be introduced into the interior of said casing and having a slightly smaller lower end by reason of the taper imparted to said casing, a disc integrally secured to the smaller lower end of said casing to form a closed bottom for the casing, a flexible chain attached at one end to said casing adjacent the upper end thereof for maintaining said closed end submerged beneath the surface of a body of water and said open end above the surface of said body of water so that ice forming around the outer surface of said casing intermediate its upper and lower ends assumes the taper of said casing, and a fastening element carried at the other end of said chain, whereby the igniting of combustible material introduced into the interior of said tubular casing produces heat causing thermal expansion of said casing with the consequence that said tubular casing is urged upwardly.

4,114,305

ILLUMINATED FISHING LURE

Andrew M. Wohlert, St. Charles, and James Haruch, Clarendon Hills, both of Ill., assignors to Riverbank Laboratories, Inc., Geneva, Ill.

Filed Nov. 10, 1976, Ser. No. 740,425

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—17.6 **6 Claims**

1. A fish lure, comprising

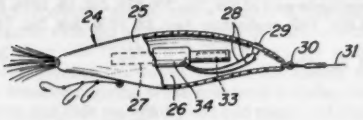
a body,

a pulse generator hermetically sealed within said body,

said pulse generator including a non-magnetic tube closed at both ends, a coil of insulated, conductive wire wound on an intermediate section of said tube, and an elongated, axially polarized, permanent magnet slidably disposed in said tube,

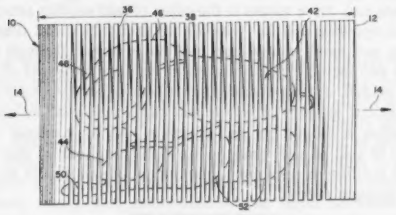
an electric lamp mounted to said body in a position to be visible from the exterior of said body

conductive means electrically connecting said lamp across said coil, and



means for attaching a fishing line to said body so that a longitudinal jerk of said line causes said magnet to move through said coil to generate a pulse of current which causes said lamp to emit a flash of light.

4,114,306
SPRING TOY
Lester V. Molenaar, Box 777, West Highway 40, Willmar, Minn. 56201
Filed Oct. 18, 1976, Ser. No. 733,199
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 R **43 Claims**



41. A spring toy comprising: an elongated flexible band having an outside edge surface extended generally parallel in direction of the band thickness, said band including first and second portions of contrasting colors, each portion spanning the length and width of the band the spanning part of the band thickness, said band disposed about a central axis to form a coil having a plurality of repetitive turns substantially equal in size and aligned with one another, wherein the outside edge surface is parallel to the central axis, and the visual means on portions of the outside edge surfaces of at least some of the turns to provide a normal visual configuration, said configuration being distorted with respect to its normal configuration by selectively bending the band.

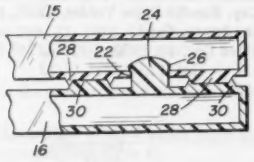
4,114,307
ADJUSTABLE CONFIGURATION TOY
Arthur S. Liebeskind, 5905 Bonnie View Dr., Baltimore, Md. 21219
Filed Feb. 4, 1977, Ser. No. 765,835
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—1 R **2 Claims**

1. An adjustable configuration toy, having a plurality of identical module units that are movably and removably coupled to each other sequentially, one after the other, in a manner so that each module unit is rotatable about the point of coupling with the next sequential unit, and capable of being disassembled into the individual identical module units, and comprising:

a plurality of identical module units, each sequentially coupled to each other at the interface of the side of one unit with the side of the next sequential unit, said coupling being near the end of the interfacing sides;

a plurality of apertures, one said aperture in each said identical module unit, said aperture located at the center of the point of coupling of one unit to the next sequential module unit, said aperture serving as the female element of said coupling;

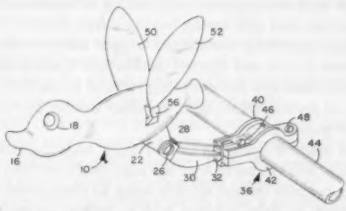
a plurality of pins, one said pin in each said identical module unit, said pin being integral with side of each said identical module unit and located at the center of the point of coupling of one module unit to the next sequential module unit, said pin serving as the male element of said coupling and at assembly being opposite said female element of coupling of next adjacent sequential module unit as the sides of two sequential module units interface, said male element and said female element of coupling of each identical module unit being located at opposite ends and on opposite side faces of said identical module unit;



a plurality of spaced detent ridges radially surrounding the periphery of each said female element and each said male element of said coupling, said detent ridges being integral with the identical module unit on which they occur, the number of spaced detent ridges radially surrounding each said female element and each said male element of said coupling being equal and the same, said detent ridges of said female element engaging said detent ridges of said male element at assembly and when an identical module unit is rotated about the center of coupling;

a locking lip on the outboard end of each said pin that is the male element of said coupling to secure the module units together when the male element of the coupling is inserted in the female element of the coupling for assembly of the identical module units in a sequential manner, said locking lip being capable of withdrawal for disassembly of the adjustable configuration toy.

4,114,308
AERODYNAMICALLY DRIVEN TOY
Charles K. Grieder, 727 S. Lyon #107, Santa Ana, Calif. 92705
Filed Jul. 27, 1977, Ser. No. 819,351
Int. Cl.[2] A63H *33/40*
U.S. Cl. 46—53 **6 Claims**



1. A bird having a body and moving wings attached thereto which can be driven by relative wind passing over said bird comprising:

a bird body;

means attached to said body for mounting it to a vehicle;

wings adapted for connection to said body having appendages that are pivotally mounted to said body to provide upward and downward flapping movement with ex-

panded openings at said pivotal mounting in said wings to allow the wings to rotate about their axes; and,

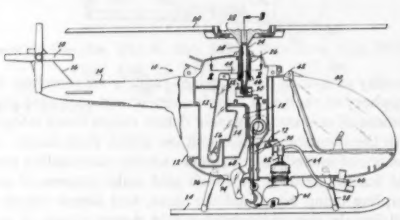
lever means in attached cooperative relationship with said appendages for providing a canting movement of said wing after it moves through its path of movement in one direction to allow relative wind to move the wing in the other direction by virtue of the canting action turning the element to allow for it to be driven by the relative wind for opposite movement from the path of moevement it has moved through.

4,114,309

TOY HELICOPTER

Derek John Gay, Rancho Palos Verdes, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 13, 1976, Ser. No. 749,737
Int. Cl.[2] A63H *27/12*
U.S. Cl. 46—75 **6 Claims**



1. In a toy helicopter, the combination comprising:

a hollow body member configured to simulate a helicopter and having a main body portion and a tail section extending outwardly therefrom along a given line;

a shaft having simulated helicopter rotor blades secured to one end thereof;

bearing means including a first bearing extending through an aperature in the upper surface of said main body portion and a second bearing within said main body portion for rotatably receiving said shaft for rotation about an axis transverse to said given line;

a reel portion on said shaft intermediate said first and second bearings;

a spring clutch including a flat constant torque coil spring encircling said reel portion, the surface of said coil spring adjacent said reel portion being adapted to frictionally engage said reel portion only during unwinding of said coil spring, said coil spring having a free end;

an elongate generally bar-shaped trigger member pivotally mounted at one end thereof within said main body portion, the other end thereof being secured to the free end of said coil spring, said trigger member having an enlarged trigger portion; and

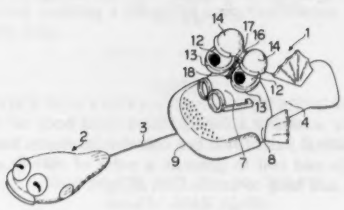
a pair of aligned openings in said main body portion, said openings and the surface of the main body portion immediately beneath the tail section being so configured and so positioned to form a pistol grip to permit access to and actuation of said trigger member by holding the toy by the pistol grip so formed, manual pivoting of said trigger member in a first direction to unwind said coil spring causing said spring to frictionally engage said reel portion to thereby rotate said rotor blades in a given direction, said trigger member being pivoted in the opposite direction under the force of said coil spring rewinding.

4,114,310

SELF-POWERED TOY ANIMAL WITH OPENABLE AND CLOSABLE EYES

Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 706,525, Jul. 19, 1976, Pat. No. 4,068,401. This application Aug. 18, 1976, Ser. No. 715,323
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—104 **7 Claims**



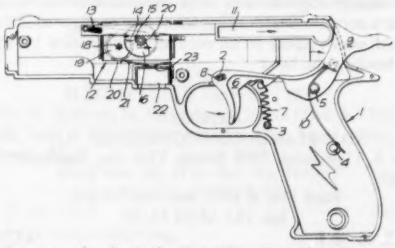
1. A toy comprising a relatively large toy animal having a hollow body part, a face part movable on said body part and defining therewith a mouth movable between open and shut positions, and at least one eye having a lid displaceable between an open position exposing said eye and a closed position covering said eye; a relatively small toy animal fittable into the interior of said body part; a tether passing through said mouth and having one end attached to one of said animals and an opposite end, drive means in the other of said animals attached to said opposite end for winding up said tether and thereby pulling said small animal into said large animal through said mouth and including a displacement element for travel of said other animal, during winding up of said tether, whereby said large animal appears to pursue and catch said small animal as said tether is wound up; and means in said large animal connected to said lid and operative for displacing said lid into said closed position in response to movement of said mouth to said open position thereof.

4,114,311

TOY GUNS

Thomas Chow, Kowloon, Hong Kong, assignor to Arco Industries Ltd., Hong Kong

Filed Mar. 29, 1977, Ser. No. 782,363
Claims priority, application United Kingdom, Aug. 27, 1976, 35778/76
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—192 **7 Claims**



1. A toy gun having a simulated barrel and handle depending from one end thereof, a trigger pivotally supported beneath said barrel adjacent the handle and movable between forward and rearward positions, a spring connected to said handle and normally urging said trigger to its forward position, a hammer pivotally supported by said one end of said barrel and having an inner end engageable releasably by said trigger to actuate said hammer rearwardly, and a tensioning spring engaging said hammer and normally urging the same toward the forward end

of said barrel, in combination with a sound-producing means mounted within said barrel and resembling the sound of a ricocheting bullet and means to actuate the same comprising an elongated slide supported within said barrel for longitudinal movement therein between and engageable with said hammer and sound-producing means, and a tension spring engaging said elongated slide and normally urging the same rearwardly, whereby when said trigger is pulled rearwardly it initially moves said hammer rearwardly against the tension of said hammer tensioning spring while said tension spring for said slide moves said slide rearwardly and said trigger subsequently disengages said hammer to release it for forward movement by said hammer tensioning spring and thereby moves said slide forwardly to actuate said sound-producing means.

4,114,312

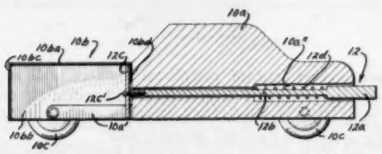
TOY VEHICLE

David V. Hendry, R.R. #1, Box 109, Cochise, Ariz. 85606

Continuation of Ser. No. 543,262, Jan. 23, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,293

Int. Cl.[2] A63H *17/26*

U.S. Cl. 46—223 **3 Claims**



1. A toy vehicle comprising a wheel-mounted body, a removable engine hood adapted to be mounted on said body, a spring-urged linearly movable release member mounted within said body for movement in a direction longitudinally of said body, and a positioning plate mounted at one end of said release member, said positioning plate disposed within said removable engine hood and engaging an inner wall thereof to normally clamp said removable engine hood between said positioning plate and said body, and wherein the other end of said release member extends from said body and serves as a manual control for the selective release of said engine hood.

4,114,313

COMBINATION DOLL AND ACCESSORY ARTICLES

Benjamin G. Guerrero, Los Angeles; Gerard K. Leistikow, San Pedro, and Norman E. Sindlinger, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 21, 1977, Ser. No. 761,124

Int. Cl.[2] A63H *13/18*

U.S. Cl. 46—264 **13 Claims**

1. In a toy, the combination comprising:

a doll having a generally hollow head and a body having a neck portion with a neck opening, the outer periphery of said neck portion having a spherically contoured surface for engaging a matingly configured opening in said head to provide a swivel connection;

a weighted mass fixedly mounted within said head;

means mounted in said body adjacent said neck opening for mounting said weighted mass for rotation relative to said neck opening;

means within at least one of said body and head operatively coupled to said mounting means for rotating said head in an orbital path with respect to said body; and

an article adapted to be moved to and fro with respect to a support therefor in response to a shifting weight on said article, said article including means configured for receiving the body of said doll and maintaining it with the head thereof spaced from surfaces of said article for permitting orbital movement of said head for moving said article to and fro in response to said orbital movement.

4,114,314

PROCESS FOR THE PRODUCTION OF THEBAINE

Ali Shafiee; Iraj Lalezari, and Narges Yassa, all of Tehran, Iran, assignors to The Ministry of Science & Higher Education, Tehran, Iran

Filed Feb. 22, 1977, Ser. No. 770,307

Int. Cl.[2] A01G *1/00*

U.S. Cl. 47—85 **7 Claims**

1. A process for the production of thebaine which comprises the steps of:

(i) sterilising the surface of seed heads from Papaver bracteatum Lindl:population Arya II;

(ii) establishing aseptically callus tissue cultures of said seed heads in nutrient media;

(iii) growing said callus tissue cultures in said nutrient media;

(iv) subculturing said callus tissue cultures under aseptic conditions to form subcultures in fresh nutrient media;

(v) growing said subcultures;

(vi) subculturing said subcultures and growing further subcultures therefrom;

(vii) incubating and harvesting said further subcultures;

(viii) extracting the contents of cells grown in said further subcultures and media;

(ix) separating said contents from tissues and media;

(x) bringing said contents into contact with a non-aqueous solvent to form a solvent extract; and

(xi) isolating a thebaine-containing fraction of said solvent extract by chromatographic fractionation.

4,114,315

PROCESS FOR GROWING ALFALFA SPROUTS FROM SEED AND APPARATUS THEREFOR

Pamela A. Rinella, Box 682, Mt. Lemmon, Ariz. 85619

Filed Oct. 5, 1977, Ser. No. 839,409

Int. Cl.[2] A01G *31/02*

U.S. Cl. 47—61 **9 Claims**

1. A process for growing alfalfa sprouts from seed, said process comprising the steps of:

I. germinating the seeds, said step of germinating comprising the steps of:

a. soaking the seeds in a solution of water and bleach;

b. rinsing the soaked seeds;

c. storing the rinsed seeds at a first temperature range;

d. rinsing and draining the stored seeds;

e. storing the rinsed and drained seeds at a second temperature range lower than the first temperature range;

II. growing the alfalfa sprouts from the germinated seeds, said step of growing comprising the steps of:

a. spreading the alfalfa sprouts upon a supporting surface;

b. wetting the spread alfalfa sprouts;

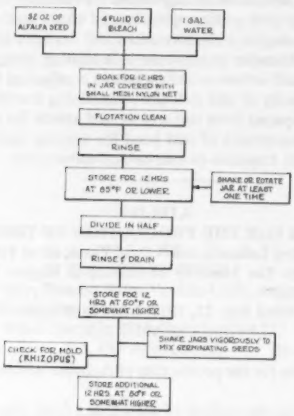
c. covering the wetted alfalfa sprouts to shield them against light without inhibiting a flow of air around and about the covered alfalfa sprouts;

d. storing the alfalfa sprouts at the second temperature range;

e. periodically wetting the stored alfalfa sprouts during said storing step;

f. recovering the stored alfalfa sprouts with light penetrable cover;

g. cyclically transferring the recovered alfalfa sprouts from a dark environment at the second temperature


SEOZ OF ALFALFA SEED
4 FLUID OZ BLEACH
1 GAL WATER
SOAK FOR 12 HRS IN JAR COVERED WITH SMALL MESH NYLON NET
FLOTATION CLEAN
RINSE
STORE FOR 12 HRS AT 65°F OR LOWER
SHAKE OR ROTATE JAR AT LEAST ONE TIME
DIVIDE IN HALF
RINSE & DRAIN
STORE FOR 12 HRS AT 60°F OR SOMEWHAT HIGHER
CHECK FOR MOLD (RHIZOPUS)
SHAKE JARS VIGOROUSLY TO MIX GERMINATING SEEDS
STORE ADDITIONAL 12 HRS AT 60°F OR SOMEWHAT HIGHER

range to an environment at the first temperature range and having a source of light;

h. periodically wetting the recovered alfalfa sprouts during said step of transferring; and

i. harvesting the alfalfa sprouts.

4,114,316

GROWING PLANTS IN AN AQUARIUM

Merrill Cohen, 3418 Edcrest Rd., Baltimore, Md. 21207

Continuation-in-part of Ser. No. 697,028, Jun. 7, 1976, Pat. No. 4,074,997. This application Nov. 11, 1977, Ser. No. 850,645

Int. Cl.[2] **A01G** *31/02;* **A01K** *63/00*

U.S. Cl. 47—64 **6 Claims**

1. A process which comprises rooting an aquatic plant in integral, non-floating, plant-food-enriched, growth supporting and plant-holding solid substrate submerged in water and wherein the substrate comprises a water-cured hydrophilic-polyurethane-prepolymer foam composition having sufficient filler means to render the composition denser than water and in which components are substantially-permanently bonded together by the water-cured foam even when the solid substrate is submerged in water over an extended period of time.

4,114,317

WINDOW AND DOOR CONSTRUCTION

Richard K. Crawley, Box 29, North Star Rte., Dover, Ark. 72837

Filed Dec. 20, 1976, Ser. No. 752,106

Int. Cl.[2] **E05D** *15/10*

U.S. Cl. 49—209 **28 Claims**

1. In a window and door construction, an improvement comprising:

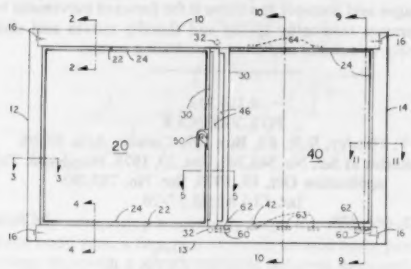
(a) an outside frame structure having upper head and lower sill horizontal members, and vertical end jamb members, said outside frame structure defining adjacent first and second interior peripheral channels therein;

(b) a vertical central mullion interlocker member located within the head and sill horizontal members first interior peripheral channel intermediate the end jamb members defining a first and second opening in said outside frame structure, said mullion interlocker having adjacent first and second lengthwise channels therein;

(c) a fixed window panel interior to said outside frame structure first opening, said fixed window panel in air and watertight sealed relationship to said first interior peripheral channel and said mullion interlocker first lengthwise channel;

(d) a vent window panel interiorly to said outside frame structure second interior peripheral channel, said vent window panel movable upon sill track means attached to said sill horizontal member;

(e) sealing means attached, in part, to said outside frame structure and said vertical mullion interlocker member, said sealing means engaging and forcibly urging said movable vent window panel against said outside frame structure second interior peripheral channel wall and said mullion interlocker in an airtight and watertight configuration when said panel is in position closing said outside frame structure second opening; and



(f) vent window seal actuating latch means interposed said movable vent window panel and said vertical mullion interlocker member, said latch means forcibly urging said movable vent window panel to a final closed sealed position, locking said vent window panel, and forcibly unsealing and opening said vent window panel.

4,114,318

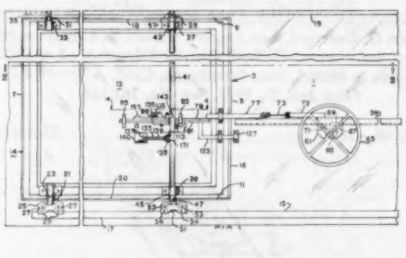
PLUG DOOR OPERATING AND MOVING MECHANISM

Dale L. Brindle, Chambersburg, PA, assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed Aug. 26, 1977, Ser. No. 827,850

Int. Cl.[2] **E05D** *15/10;* **E05F** *11/00*

U.S. Cl. 49—215 **18 Claims**



1. In combination, a wall having a door opening, a plug door for said opening, means mounting said door for movement transversely of the wall between positions within and outside of said opening and longitudinally of the wall out of and into longitudinal registry with said opening, said mounting means including a track mounted on the wall generally in parallel relation therewith, a carriage riding on said track structure fixed against movement longitudinally of said door including an upright shaft rotatably journaled on the door and having a crank pivotally mounted on said carriage and rotatable by said shaft between a door closed position angular and a door open position generally parallel with respect to said wall, means for selectively rotating said shaft between door open and door closed positions, and resilient rotation-resisting means mounted

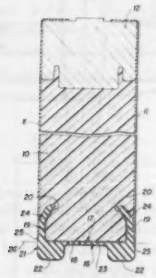
on said door and engaging said shaft for maintaining said shaft in the selected door-closed and door-open rotational positions.

4,114,319

BOTTOM SWEEP AND RAIL UNIT FOR FOAM-FILLED DOORS

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Dec. 23, 1977, Ser. No. 863,908
Int. Cl.[2] E06B *7/16*
U.S. Cl. 49—488 **5 Claims**



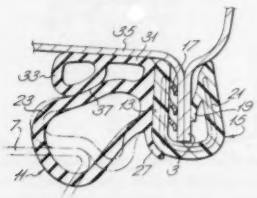
1. A unitized prefabricated bottom rail and bottom sweep assembly for foam-filled doors having metal skins thereon, said assembly comprising a channel cross section sheet metal bottom rail of lesser width than the thickness of a door between the metal skins which receive said assembly, and a bottom sweep of elastic material molded on the exterior surfaces only of the channel cross section sheet metal bottom rail in permanently bonded relation thereto, said unitized assembly adapted for snug insertion in the bottom of a foam-filled door between the metal skins thereof in lieu of the customary wood bottom rail and separately attached sweep, the entire interior surface of the sheet metal bottom rail being exposed for direct contact with foam material in said door between the metal skins of the door.

4,114,320

DOOR SEALS

Ronald Ernest Pullan, Leeds, England, assignor to Schlegel(UK) Limited, Leeds, England

Filed Aug. 3, 1977, Ser. No. 821,526
Claims priority, application United Kingdom, Aug. 31, 1976, 36061/76
Int. Cl.[2] E06B *7/16*
U.S. Cl. 49—491 **10 Claims**



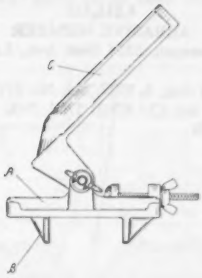
1. A seal for sealing the gap between a door frame and edge of a door on a motor vehicle, said seal being extruded from resiliently deformable plastics or rubber material and comprising a tubular portion, one face portion of which is adapted to be connected to said door frame, and another face portion remote from said one face portion which, in use, is abutted by and deformed by the edge of said door when the latter is closed, and a deforming member having one end portion connected to said tubular portion, and its opposite free end portion normally spaced from said tubular portion and extending toward said door frame when said seal is in position to be mounted on said door frame, said deforming member further having means for engaging said door frame when said seal is mounted on said door frame whereby said free end portion is deflected by said door frame into engagement with a part of said tubular portion to deform the latter and change its cross-section, thereby altering its sealing characteristics.

4,114,321

POOL HAND CLEANING DEVICE HOLDER

Clarence W. Jarvis, 6429 Walnut Ave., Orangevale, Calif. 95662, and Richard A. Wenrich, 3036 Q St., North Highlands, Calif. 95660

Filed Jul. 28, 1977, Ser. No. 819,949
Int. Cl.[2] A46B *17/02*; E04H *3/20*
U.S. Cl. 51—205 R **1 Claim**



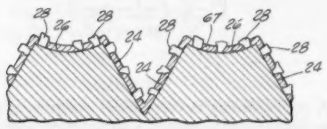
1. A pool cleaning device holder comprising a combination of a rectangular base means, a slide clamp means, and a pole adapter means wherein the rectangular base means consists of two side bar means with a guide means transversing the length of the inside surfaces, and an end bar means at one end, and a guide flange means at the other end, whereby the side bar means and the end bar and guide flange form a rectangular opening in the center of the rectangular base means serving to receive the slide clamp means, which means is inserted therein, and whereby a clamp jaw means protruded downward from one end of the slide clamp means, with the top surfaces of the ends of the clamp jaw means abutting the bottom surface of the guide means which is incorporated in the side bar means of the rectangular base means, and four lug means protruding outward, two from each side of the top surface of the slide clamp means, whereby said lug means rest on the top surface of the guide means, allowing the slide clamp means to slide back and forth on the guide means and within the said rectangular opening formed by the side bar means and the ends of the rectangular base means, which rectangular base means has incorporated at one end thereof a second and stationary clamp jaw means protruding downward therefrom, said latter means opposing the clamp jaw means protruding downward from the slide clamp means, allowing the combination of the two said clamp jaw means to firmly hold a rectangular object of various sizes between them, a bolt and nut means, for moving the two jaw means towards each other, that runs through two guide flange means, with holes therein, of which one guide flange means protrudes upward from the clamp jaw means end of the rectangular base means, and the other guide flange means protrudes upward on the end of the slide clamp means which is opposite the end containing its clamp jaw means, and where further, the rectangular base means containing the slide clamp means being attached to a pole adapter means through the use of two attachment flange means with holes therein, which means protrude upward from the center of the side bar means of the rectangular base means, and two additional attachment flange means with holes therein protrude downward from a rectangu-

lar plate means at one end of the pole adapter means, said combination of attachment flange means being held together through the use of bolt and nut means extended therethrough, whereby the rectangular base means is held firmly in place on the pole adapter means and further, can be set at various angles thereto and held firmly in place at the proper angle for use thereon, and whereby extending outward from the rectangular plate means and forming the remainder of the pole adapter means is an elongated concave holding arm containing a concave inside surface which allows the holding arm, and thereby the pole adapter means, to be attached to a one and one-quarter inch commercial swimming pool service pole, and where said holding arm has therein and transversing the length thereof, a slot which is adapted to receive attachment bolts which are a part of the said commercial swimming pool service pole, whereby the complete assembly of the rectangular base means containing the slide clamp means with both means attached to the pole adapter means, are all able to be firmly held in place on the said commercial swimming pool service pole.

4,114,322
ABRASIVE MEMBER

Harold Jack Greenspan, 5334 Holt Ave., Los Angeles, Calif. 90056

Filed Aug. 2, 1977, Ser. No. 821,232
Int. Cl.[2] B24D *5/02, 7/02*
U.S. Cl. 51—206 R **8 Claims**



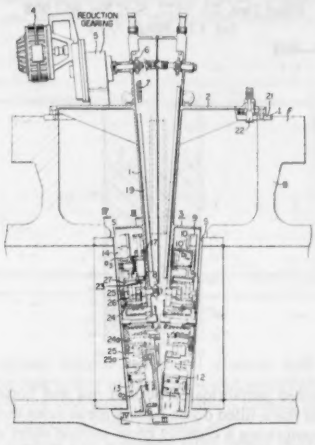
1. An abrasive member comprising:
(a) a rotatable wheel-shaped base member having a rim and a hub, said member being adapted to rotate about a transversely extending axis;
(b) a wearable working surface provided on said rim, said working surface comprising a multiplicity of ridges extending thereacross at an acute angle of about 30° with respect to a line parallel to the axis of rotation of said base member; said ridges having sloping side walls terminating in a concave upper surface, and;
(c) a multiplicity of diamond particles bonded to said side walls and upper surfaces of said ridges so that at least portions thereof extend outwardly therefrom.

4,114,323
DEVICE FOR AUTOMATICALLY LAPPING WEDGE-GATE VALVE SEAT

Masami Okano, and Shozo Yoshitomi, both of Kita-kyushu, Japan, assignors to Okano Valve Seizo Kabushiki Kaisha, Kita-kyushu, Japan

Filed Oct. 4, 1976, Ser. No. 729,603
Claims priority, application Japan, Oct. 13, 1975, 50-122419
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—241 VS **2 Claims**

1. A device for automatically lapping a wedge-shaped gate valve seat, comprising, in combination, a main frame having a flange for attaching the lapping device to a valve body of a gate valve having wedge-shaped inlet and outlet valve seats, and a guiding unit extending into the valve body for positioning between and opposed to said pair of valve seats, at least one lapping plate disposed within said guiding unit, driving means within said guiding unit for driving said lapping plate in a combined rotating and eccentric movement relative to the axis of rotation of said lapping plate in said rotating movement, means within said guiding unit for moving said lapping plate in the axial direction of said rotating movement for urging said lapping plate against one of said valve seats, lapping agent feeders in said guiding unit and having operating means for moving said feeders radially and coating a lapping agent on said one valve seat, cleaning wipers in said guiding unit each having a rotatable wiping member and wiping member moving means for interposing said wiping member between said lapping plate and said valve seat, leakage sensors in said guiding

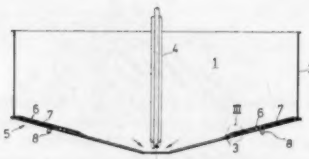


unit and leakage sensor moving means for moving said leakage sensors into compressive contact with said valve seat for automatically sensing whether said one valve seat has been satisfactorily lapped by the utilization of a fluid pressure, and a periscope type observation glass extending through said guiding unit and having an extremity extending to a position adjacent said one valve seat.

4,114,324
SILO FOR BULK MATERIALS WITH FLUIDIZING MEANS

Otmar Link, Büchen-Gotzingen, and Gerhard Nied, Rosenberg, both of Fed. Rep. of Germany, assignors to AZO-Maschinenfabrik Adolf Zimmermann, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,527
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612258
Int. Cl.[2] E04B *1/345;* **E04H** *7/22*
U.S. Cl. 52—2 **8 Claims**

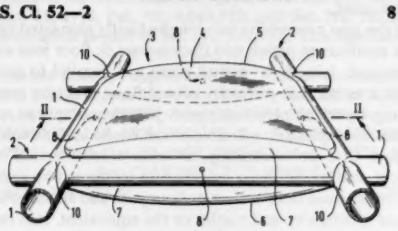


1. Silos for bulk materials, comprising a rigid base and a fluidizing means which comprises an air-pervious floor of a resilient fabric or mesh of natural or artificial fibres arranged above the rigid base, a support surface means holding the said floor in spaced relation relatively to the rigid base and at least one compressed air supply duct opening into the intermediate space between the rigid base and the mesh floor, the support surface means being constituted by a helical wire laid on the rigid base.

4,114,325
INFLATABLE STRUCTURE

Alfred Hochstein, Viersener Strasse 50, Krefeld 1, Fed. Rep. of Germany (4150)

Filed Jul. 21, 1977, Ser. No. 817,732
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 7623114[U]
Int. Cl.² E04B *1/34*
U.S. Cl. 52—2 **8 Claims**



1. An inflatable structure having a plurality of inflatable interconnected unit cells, each unit cell comprising:

at least three hollow inflatable framework tubes lying in the same plane, said hollow inflatable framework tubes integrally connected to each other such that two of said hollow inflatable framework tubes interconnect at each of the corners of said unit cell forming a continuous pathway within the framework tube of each unit cell and each framework tube serving as a framework tube between two adjacent unit cells,

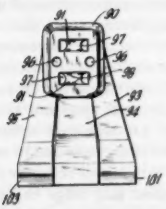
a hollow inflatable cushion fitting within the area defined by the framework tube of each unit cell,

said inflatable cushion abutting against said framework tube, and partially wrapping around the framework tube such that that portion of said inflatable cushion which abuts against said framework tube forms a concave surface which mates against a portion of said framework tube.

4,114,326
FIXTURE HANGING ASSEMBLY

Henry J. Macuga, and Bernard F. Deschamps, both of Ware, Mass., assignors to Eclipse Mfg. Inc., Ware, Mass.

Continuation-in-part of Ser. No. 455,575, Mar. 28, 1974, abandoned. This application Aug. 19, 1976, Ser. No. 715,822
Int. Cl.² E04F *19/00*
U.S. Cl. 52—28 **15 Claims**



1. In combination with an open grid type suspended ceiling frame construction incorporating ceiling blocks supported by pairs of spaced interconnected inverted T-bars, a fixture hanging support for bridging the space between a pair of adjacent T-bars and including:

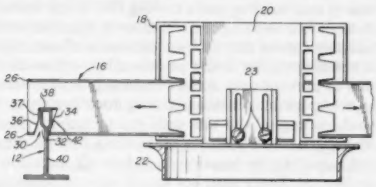
(i) an elongated flat hanger strap having free opposite distal end portions; and

(ii) a pair of clips or mounts, each engageable with one of the distal end portions of the hanger strap, said clips or mounts being constructed of flame-resistant plastic and comprising a horizontally extending component in communication with a trio of spaced resilient legs with the pair of outside legs adapted to embrace one side of the T-bar and the intermediate leg being adapted to embrace the opposite side of the T-bar wherein each of the legs terminates at its bottom end in a tapered portion whereby forcing the clip into engagement with the top of the T-bar cooperates with each said tapered portion to automatically urge the legs apart and into proper engaging alignment, wherein said horizontally extending component is provided with a plurality of open-ended pockets adapted to receive said free distal end portion of said hanger strap and wherein each of said pockets is provided with ribs extending lengthwise in the pocket to insure a snug friction fit when said free distal end portion of said flat hanger strap is received.

4,114,327
LIGHT FIXTURE SUPPORT

Arthur C. Williams, 21711 Glenbranch, Spring, Tex. 77373

Filed May 13, 1977, Ser. No. 796,725
Int. Cl.² H05B *33/02*; E04F *19/00*
U.S. Cl. 52—28 **12 Claims**



1. A light fixture support for a suspended ceiling, having inverted "T" ceiling members with upstanding portions having an enlarged extremity comprising

at least one support having an integral locking section carrying a slot having an angled entrance portion for angularly receiving the upstanding enlarged portion of said "T" member and a vertical shoulder portion for engaging one side of said "T" member while a first edge of said angled entrance portion of said slot engages the other side of the upstanding enlarged portion of said "T" member for retaining said "T" member within said slot,

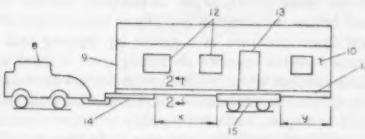
said angled entrance portion being further defined by said first edge intersecting an edge of said light fixture support member at an oblique angle and a second edge parallel to said first edge and spaced apart therefrom to admit said enlarged portion of said "T" member and intersecting said verticle shoulder portion, and

means for engaging a light fixture.

4,114,328
PREFABRICATED TRANSPORTABLE BUILDING WITHOUT CONTINUOUS STEEL CHASSIS

Robert Raymond Lawrence, 205 W. Fifth St., Alturas, Calif. 96101

Filed Sep. 13, 1976, Ser. No. 722,882
Int. Cl.² E04B *1/343*
U.S. Cl. 52—79.1 **5 Claims**



1. A prefabricated building comprising an elongated horizontally disposed planar floor structure and vertical exterior

walls extending above said floor a predetermined distance to support a roof structure said roof structure comprising a multitude of parallel roof trusses forming an inclined plane with their top chords and a horizontal plane with their bottom chords, said floor structure comprising a multitude of parallel floor joist or floor trusses covered on their top edges with floor decking said floor structure having a vertical thickness substantially equal to the depth of said floor trusses or floor joist, further comprising,

a. at least one exterior side wall lying parallel to the longitudinal axis of said prefabricated building comprising,

a frame composed of a multitude of vertical elongated studs parallel to each other and lying in a vertical plane said studs connecting to a top plate at their upper ends and to a bottom plate at their lower ends,

sheathing comprising substantially shear resistive material attached to a side of said frame,

means for resisting loads when transporting said prefabricated building, which is devoid of presently customary continuous steel chassis, over the road without over stress of said side wall said means being generally by providing said side wall as a deep girder in a simple span between a building carrier position between afront and rear of said building and a towing "A" frame toward the front of said building and a cantilever span between said building carrier and the rear extremity of said building,

said building carrier being positioned in a fore-aft direction to prevent over stress of said side wall functioning as a deep girder when supporting contributary over the road loading of said side wall and including increasing the length of the building carrier in a fore-aft direction and adjusting its location in a fore-aft direction until neither cantilever span nor simple support spans induce over stress in said side wall girder,

door means positioned in said said wall so that side wall will act as a girder when supporting over the road loading of said side wall and is not structurally weakened, said door means being positioned directly over or as near to directly over, said low level building carrier as practicable,

window means provided in said side wall so that side wall acting as girder when supporting over the road loading is not structurally weakened, said window means being provided by reinforcing and/or minimizing size of said opening as necessary and locating said openings in regions of low shear stress of said side wall functioning as a girder,

said sheathing of said side wall being connected to a rim joist said sheathing being substantially shear resistive,

b. an exterior front end wall of said building said end wall lying perpendicular to the longitudinal axis of said building, comprising,

a frame composed of a multitude of vertical elongated studs parallel to each other and lying in a vertical plane said studs connecting to a top plate at their upper ends and to a bottom plate at their lower ends,

exterior sheathing comprising substantially shear resistive material attached to the exterior side of said frame,

end wall reinforcing means reinforcing said end wall to resist load reactions produced by said towing "A" frame said means being generally by providing said end wall as a deep girder in a span between side extremities of said building,

window means provided in said end wall said window means being provided by developing portion of said wall below window sill and above bottom extremity of said floor structure as a girder by lapping said shear stress resistive exterior sheathing over a front attachment member which underlies the front wall and attaching thereto by adhesive and/or mechanical fasteners such as staples, nails or screws,

said end wall reinforcing means including transferring concentrated load reactions of towing "A" frame into said end wall without overstress said reinforcing means including a steel load distributing member which is a part of said towing "A" frame and bolting or lag screwing said steel load distributing member to said shear resistive sheathing and to said front attachment member underlying said front end wall,

said front attachment member being minimum two inch nominal wood or plywood and, in effect, substituting for the individual floor truss or floor joist occurring at this point,

c. said rim joist comprising two longitudinally elongated rim joist members to which said floor trusses or floor joist are connected, lying in a vertical plane and parallel to each other at either side extremity of said floor structure comprising wood or plywood pieces joined and spliced together by staples and adhesive or the equivalent in such a manner that no weakening or cross section results at splices, said splices being individually reinforced by scabs placed between floor trusses or floor joist and attached by means of adhesive and staples or the equivalent, said rim joinst being connected to said floor trusses or floor joist by mechanical fasteners such as screws, staples or nails extending through said rim joist and into end post of floor trusses or into end grain of floor joist, said rim joist members being connected to said steel load distributing members which are a part of said building carrier and said towing "A" frame, respectively, by placing portions of said steel load distributing members flat against said rim joist and connecting thereto with mechanical fasteners such as lag bolts or bolts,

d. a ridge beam lying in a vertical plane and vertically above the marriage line of said building, having a length substantially equal to the length of said building and a width substantially equal to the height of said roof trusses and being attached thereto, comprising either an open web truss type or a solid web girder type, ridge beam reinforcing means resisting loads when transporting said prefabricated building, which is devoid of presently customary continuous steel chassis, over the road without over stress of said ridge beam, said ridge beam reinforcing means being generally by providing said ridge beam as a girder in a cantilever span between a marriage wall rear extremity and rear extremity of said prefabricated building and in simple span between a front extremity of said marriage wall and said towing "A" frame, said ridge beam being supported by said end walls at each end of said ridge beam and said marriage wall lying between said end walls and directly under said ridge beam, said building carrier being positioned to prevent over stress of said ridge beam when supporting contributary over the road loading of said ridge beam and including increasing the length of said building carrier in fore-aft direction and by positioning said low level building carrier in fore-aft direction such that neither cantilever span nor simple support span of said ridge beam produce over stress of said ridge beam, said ridge beam being connected to said end walls and said marriage wall, said means being by providing steel straps placed flat against said ridge beam and said walls and attaching said straps with mechanical fasteners such as staples, nails or screws,

e. said marriage wall lying parallel to the longitudinal axis of said prefabricated building comprising,

a frame composed of a multitude of vertical elongated studs lying parallel to each other and in a vertical plane, said studs connecting to a top plate at their upper ends and to a bottom plate at their lower end,

exterior sheathing comprising substantially shear resistive material attached to exterior side of said studs,

said marriage wall being positioned to support said ridge beam and being placed directly over, or as nearly so as practicable, said low level building carrier.

4,114,329
ANCHORING ARRANGEMENT KIT

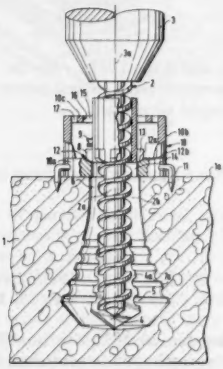
Artur Fischer, Weinhalde 34, 7241 Tumlingen, Fed. Rep. of Germany, and Klaus Fischer, Tumlingen, Fed. Rep. of Germany, assignors to Artur Fischer, Tumlingen-Waldachtal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 725,138, Sep. 17, 1976, Pat. No. 4,050,202, Ser. No. 719,146, Aug. 31, 1976, and Ser. No. 631,153, Nov. 11, 1975, Pat. No. 4,044,512, said Ser. No. 725,138, is a continuation-in-part of Ser. No. 631,153,. This application May 5, 1977, Ser. No. 794,238

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525452; Jun. 14, 1975, 2526744; Jun. 21, 1975, 2527773; Nov. 14, 1974, 2453957; May 26, 1975, 2523198; Jun. 6, 1975, 2525220; Sep. 19, 1975, 2541762; Sep. 5, 1975, 2539521; Oct. 4, 1975, 2544468; Oct. 23, 1975, 2547412; Nov. 3, 1975, 2549057

Int. Cl.[2] E21B *17/10;* E04B *1/41*

U.S. Cl. 52—173 R 26 Claims



1. A kit for use with a drive in establishing arrangements for securing objects to support structures, comprising a drilling tool for drilling anchoring holes in support structures, having a free end provided with cutting edges and another end adapted to be engaged by the drive for rotating said tool about an axis; means for supporting said tool at an exposed surface of a respective support structure, including a collar member adapted to be mounted on said tool intermediate said ends thereof for joint rotation therewith, and an abutment member adapted to surround said tool and contact said exposed surface, said members having respective concave and convex contact surfaces which, upon slidingly contacting one another, constitute a bearing for movement of said tool between a plurality of positions in which said axis encloses different angles with said exposed surface to thereby increase transverse dimensions of a respective hole in direction away from an open end thereof that opens onto said exposed surface; a plurality of anchoring elements each having a leading end portion of transverse dimensions smaller than, and a trailing end portion of transverse dimensions substantially corresponding to, those of said open end so that said trailing end portion supports said element in said open end with a clearance around said leading end portion and closes said open end upon insertion of said element into said hole; and means for introducing hardenable material into said clearance to form a hardened body around said leading end portion of said element to anchor the latter in said hole upon hardening of said material, including an internal passage bounded by an internal surface and extending through said element between said end portions of the same, at least one opening communicating said passage with said clearance at said leading end portion of said element, and shielding means for guiding said material through said passage toward said opening and for separating such material from a region of said internal surface which is located upstream of said opening.

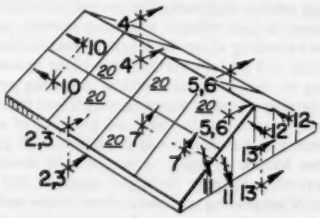
4,114,330
SKYLIGHT SYSTEM

Ronald D. Sukolics, Elkhart, Ind., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Nov. 4, 1976, Ser. No. 738,944

Int. Cl.[2] E04B *7/18*

U.S. Cl. 52—200 54 Claims



1. A skylight comprising:

a sill for supporting a lower edge of at least one panel frame mounted thereon, and

at least one pre-assembled panel frame including a lower edge member for interlocking attachment on said sill and a pair of upwardly sloping side frame members secured to said lower edge member,

said members, each including an elongated glazing pocket for receiving an edge portion of a glazing panel, and at least one of said sloping members including gutter means for collecting liquid from said glazing panel carried thereby,

said gutter means arranged to discharge into gutter means formed by said lower edge member,

said sill including a pair of upstanding walls and a bottom wall forming sill gutter means for receiving liquid collected in said gutter means of said members of said panel frame,

said side frame members each including means for interlocking connection with a side frame member of an adjacent panel frame.

4,114,331
EXTERIOR WINDOW UNIT

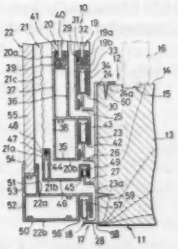
Yukio Yamamoto, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 764,978

Claims priority, application Japan, Feb. 7, 1976, 51-132510

Int. Cl.[2] E06B *3/26*

U.S. Cl. 52—202 5 Claims



1. An exterior window unit for covering an opening in a building wall, said opening having at its lower edge a first sill, said exterior window unit comprising:

(a) a frame having a second sill for extending along the length of said first sill below the lower edge of said opening, said second sill having a vertical mounting portion with a mounting surface having means by which it may be

mated flatwise with and secured to a vertical exterior surface of the first sill below said opening;

(b) a plurality of rail portions of L-shaped cross-section, each having a horizontal leg individually secured independently of each other directly to a vertical exterior surface of said vertical mounting portion at vertically spaced points opposite to said mounting surface, and each having a vertical leg directed as an upwardly extending vertical flange section each being the nearest horizontally adjacent element to said vertical mounting portion, said rail portions extending along the length of said vertical mounting portion and all said vertical legs being spaced vertically along the height of said vertical mounting portion; and

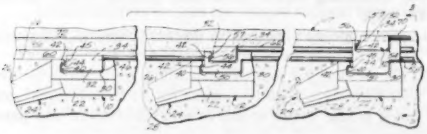
(c) a plurality of sashes mounted within said frame in parallel closely spaced relationship, said plurality of sashes corresponding in number to said plurality of rail portions, said sashes having engaging means at their lower edges, respectively, engaging the upper edges of said flange portions of supporting said sashes from below and for guiding the horizontal movement of said sashes therealong.

4,114,332

ANCHORING SYSTEM FOR PRESTRESSED CONCRETE PIPE

Harry H. Robertson, San Pedro, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Apr. 27, 1977, Ser. No. 791,296
Int. Cl.[2] F16L *9/00*
U.S. Cl. 52—224 **6 Claims**



1. An anchor system for wire, the system comprising:

an embedment anchor having a recess in it,

an insert block disposed in the embedment anchor recess and projecting from the embedment anchor, the insert block having a recess in it, and

an anchor block disposed in the insert block recess, the anchor block having a recess in it for receiving the wire to be anchored, and the insert block having a groove in it to receive another wire which is secured by a different anchoring system.

4,114,333

WALL PANEL UNIT

Harold E. Jones, 4901 Minneapolis Ave., Mound, Minn. 55364, and Donald T. Ottenweller, 4285 Circle Dr., Wayzata, Minn. 55391

Filed Apr. 5, 1977, Ser. No. 784,690
Int. Cl.[2] E04B *2/04*; E04C *2/24, 2/36*
U.S. Cl. 52—265 **24 Claims**

1. A plurality of engageable load bearing panel units for a wall, each panel unit comprising:

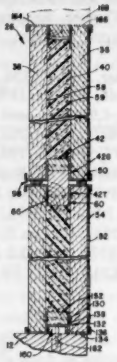
co-extensive inner and outer panels, each panel comprising chemically treated wood fibers which have been mixed with cement and bound together under pressure then cured and kiln dried;

a core of urethane foam connecting said panels together;

groove edge fastening means located on first peripheral edges of said panels;

tongue fastening means located on second peripheral edges of said panels; and

additional groove fastening means located on a third peripheral edge of said panels, and additional tongue fastening means located on a fourth peripheral edge of said panels so that each panel unit is engageable with another panel unit to form a stacked configuration, said fastening means each including a pair of J-shaped channel members each having



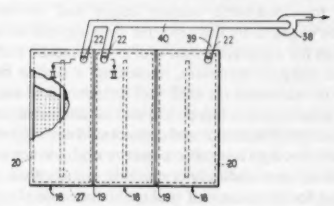
a long side and a short side, with the long sides of the J-shaped members being located between the short sides of said J-shaped members.

4,114,334

BUILDING COMPONENT

Torgny A. Thoren, Nämndemansvägen 23, 191 70 Sollentuna, Sweden

Filed Jun. 20, 1977, Ser. No. 808,178
Claims priority, application Sweden, Jun. 24, 1976, 7607287
Int. Cl.[2] E04B *1/78*
U.S. Cl. 52—303 **10 Claims**



1. A panel assembly for use as a component of an insulated building wall, comprising:

(a) a frame defining an opening;

(b) a rigid first layer secured to one side of said frame and covering said opening, said first layer being impermeable to the flow of any air;

(c) a second layer adapted to be disposed against the insulation of the building wall, and having limited permeability to airflow therethrough substantially over its entire area and being secured to the opposite side of said frame, said second layer covering said opening and being spaced from said first layer and defining therewith an airspace; and

(d) connection means comprising an opening in said impermeable first layer and adapted to be connected to an airflow system to pass air between said airspace and the airflow system, said airspace being sealed in air-tight fashion except through said second layer and said connection means, whereby air flowing through the insulation can flow simultaneously into an out of said space only through said second layer and said connection means.

4,114,335

SHEET METAL STRUCTURAL SHAPE AND USE IN BUILDING STRUCTURES

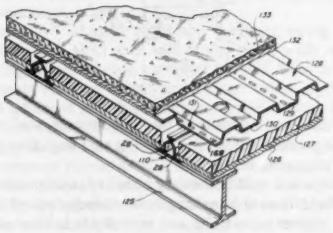
Frank E. Carroll, Barrington, Ill., assignor to Carroll Research, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 648,500, Jan. 12, 1976, Pat. No. 4,048,777, which is a continuation-in-part of Ser. No. 457,996, Apr. 4, 1974, Pat. No. 3,965,641. This application Jan. 25, 1977, Ser. No. 762,778

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] E04B *1/16, 5/10*

U.S. Cl. 52—336 9 Claims



1. In an insulated metal deck structure the components comprising:

a spaced series of parallel sheet metal structural shapes which are symmetrical about a bisecting plane through a central web having a central web, two diagonal legs projecting downwardly from one end of said web forming an included angle of about 30° to about 90° between said legs and having its vertex at the bottom of the web, said diagonal legs having a vertical height of about 1⅛ to about 10 inches, each diagonal leg having a leg projecting downward at its extremity in a plane substantially parallel to said web, said legs being substantially parallel, each of said parallel legs having flanges extending outwardly at their extremity, a closure side extending between the extremities of said flanges enclosing the area formed by said diagonal sides, said parallel sides and said closure side, and a stiffening member at the other end of said web;

insulation resting on said flanges and extending between adjacent structural shapes; and

corrugated metal decking above and fastened to the stiffening member of said structural shape.

4,114,336

ELECTRICAL SWITCHBOARD FRAMEWORK

Henri L. J. Bechet, Hermalle, Argenteau, and José J. A. Vertongen, Herstal, both of Belgium, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

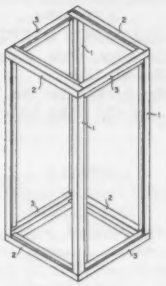
Filed Oct. 27, 1976, Ser. No. 735,921

Claims priority, application Belgium, Nov. 19, 1975, 835699

Int. Cl.[2] H02B *1/02*

U.S. Cl. 52—280 8 Claims

1. A metal electrical switchgear framework comprising structural members including angled uprights and top and bottom angled crossbars, said structural members having the same cross section, the cross section of said structural members being formed of a strip of sheet metal folded into four parts, the first part being contiguous with and perpendicular to the second part having the same width as said first part, and the third part being appreciably narrower than said first part and which is contiguous with and perpendicular to said second part, said third part being also contiguous with and perpendicular to the fourth part, said first and third parts being located on the same



side of said second part while said second and fourth parts are located on opposite sides of said third part.

4,114,337

WASTED SPACER MEMBER FOR WALL ELEMENTS, ESPECIALLY FOR GLASS BRICKS

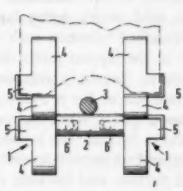
Walther C. Neuhardt, Lerchenfelderstrasse 130/7, Vienna, Austria (1080)

Filed Dec. 6, 1976, Ser. No. 747,874

Claims priority, application Austria, Dec. 15, 1975, 9490/75

Int. Cl.[2] E04B *2/00*

U.S. Cl. 52—442 22 Claims



11. In a wall construction including a plurality of glass bricks or the like arranged in layers to lie above each other with space between the top and bottom surfaces and the end surfaces of adjacent bricks for receiving mortar, the mating surfaces of said bricks each having a pair of supporting surfaces thereon extending along and adjacent to their front and rear edges, a wasted spacer member receivable between the corners of said bricks for mounting the bricks in correctly spaced relationship to receive mortar, said spacer member including: a pair of elements each carrying vertical and horizontal arms lying in a common plane, said elements being arranged parallel to each other in spaced relationship with the intersecting points of the arms of both elements lying on a common axis perpendicular to the planes of the elements; at least one web extending between and connecting said pair of arm-carrying elements, so that the distance between the outer surfaces of said elements is smaller than the thickness of said bricks to be spaced thereby but substantially greater than the minimum distance between the pairs of said supporting surfaces associated therewith, said vertical and horizontal arms of said elements having a thickness such that the bricks to be spaced thereby are in proper relationship to receive mortar when the side surfaces of said arms are in engagement with the confronting surfaces of said bricks; and outwardly projecting, removable vane means carried by each of said arm-carrying elements for enclosing the corners of the bricks, each vane means including at least one surface spaced from and extending parallel to its associated arm-carrying member, the distance between the vane means

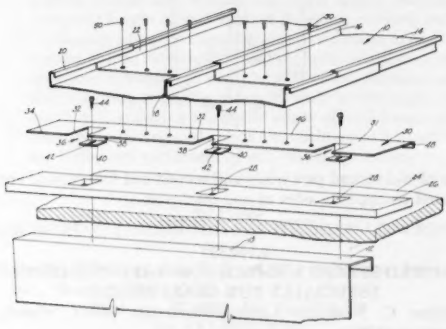
surfaces on opposite sides of the spacer member corresponding to the thickness of the bricks.

4,114,338

REINFORCING PLATE FOR OVERLAPPED JOINTS

David E. Beck, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 9, 1977, Ser. No. 795,083
Int. Cl.[2] E04B 1/00
U.S. Cl. 52—478 6 Claims



1. In a roof structure, the combination of a plurality of spaced purlins, a series of pairs of relatively stiff and rigid interlocked roof panels of channel configuration and selfsupporting capacity affixed to and enclosing the space between said spaced purlins, said panels being lapped and sealed, a thermal spacer sandwiched between each of said spaced purlins and said panels at the lapped joints thereof, said thermal spacer having apertures therein, a reinforcing backing plate overlying said thermal spacer for providing auxiliary backing support to said lapped and spaced panels to insure uniform compression of sealants, to keep the lapped joints tight under intermittent loading and to permit movement of said panels independent of said purlins, said backing plate comprising an elongated, rectangular planar member having pairs of parallel cuts evenly spaced along its length extending transversely from one long edge thereof, the material between each of said pairs of cuts being bent into a down turned mounting flange of L-shaped cross section, a first portion of said mounting flange extending downwardly from said planar member and a second portion of each mounting flange extending from said first portion so as to be substantially parallel to said planar member, said down turned mounting flanges extending through said apertures in said thermal spacer such that said second portion thereof is contiguous with said underlying purlin, each of said second portions having an aperture therein for the passage therethrough of fastening means, whereby said planar member is attached to said purlin.

4,114,339

STRUCTURE FOR COMBINING TWO BODIES AND SHEETING

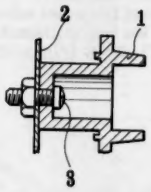
Keizo Ito, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Japan

Filed Apr. 28, 1977, Ser. No. 792,014
Claims priority, application Japan, Apr. 30, 1976, 51-50624; Apr. 30, 1976, 51-55972[U]; Feb. 28, 1977, 52-21007
Int. Cl.[2] E04B 1/38
U.S. Cl. 52—507 7 Claims

1. A device for combining two bodies, one of said bodies having an attaching hole therein, said device comprising:

(a) an engaging body attached to the other of said bodies, said engaging body including a first base portion, an engaging hole at the center of said first base portion, an engaging portion, and a pair of supporting plates projecting from said first base portion; and

(b) a clip, said clip including a second base portion, head means extending from said second base portion, said head means being insertable between said supporting plates, engaging concave means adjacent said head, and at least one arm means projecting from said second base portion



in a direction opposite to said head means, said arm means having a nail means for engaging said engaging portion of said engaging body;

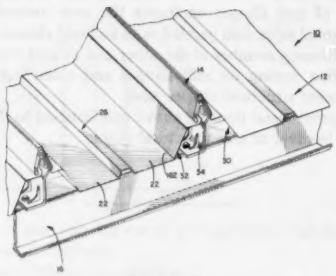
wherein when said bodies are attached, said concave means are held in said attaching hole, thereby attaching one of said bodies to said clip and said clip is held in said engaging body by the engagement of said nail means and said engaging portion.

4,114,340

SELF-INTERLOCKING STANDING SEAM FOR A BUILDING PANEL

Charles Wallace Dean, Fort Myers; Gary Eugene Cummings, Cape Coral, and Gary Lee Harvey, Fort Myers, all of Fla., assignors to Dean Steel Buildings, Inc., Fort Myers, Fla.

Continuation-in-part of Ser. No. 786,826, Apr. 12, 1977. This application Jul. 11, 1977, Ser. No. 814,721
Int. Cl.[2] E04D 1/34, 3/363
U.S. Cl. 52—520 9 Claims



1. A pair of elongate roof panel members comprising:

a male element on a longitudinal side edge of one member, said male element including a "V" shaped extension member which opens toward a roof on which said one member is mounted and has one leg thereof being connected to the one member, and the other leg thereof having an edge defining portion thereon and being connected to said one leg by an apex forming corner;

a female element on an opposing edge of said other panel member including a first channel defining portion on one longitudinal side edge thereof defining a part of a channel which opens toward a roof on which said other panel member is mounted, said other member further including a double wall skirt member having one wall thereof connected to said first channel defining portion so that said skirt extends outwardly of said first channel defining portion and toward the roof on which said other panel

member is mounted, said skirt having an end portion with the other wall thereof connected to said one wall at said end portion, said other member further including first and second planar portions and an arcuate corner connecting said planar portions together, one of said first and second planar portions being connected to the one wall of said double wall skirt member, the other member further including a third planar portion attached at one edge thereof to the other wall of said skirt member at a location remote from said skirt end portion and a fourth planar portion attached to another edge of said third planar portion to extend toward said skirt so that said third and fourth planar portions define a hook edge located between said skirt and said first planar portion adjacent said arcuate corner with said skirt covering said third planar portion and said hook edge;

said male "V" shaped extension member being wedged between said skirt and said hook edge with said edge defining portion being captured by said hook edge with said male element extension member other leg being located adjacent said third planar portion to lock the panel members together; and

a gripping element attached to a building and having a gripping element planar section located between said first and said third planar portions and a hooking element attached to said gripping element planar section and receiving said third planar portion skirt attaching edge therein.

4,114,341

COMPOSITE STRUCTURE CONSTITUTED STANDARDIZED ELEMENTS

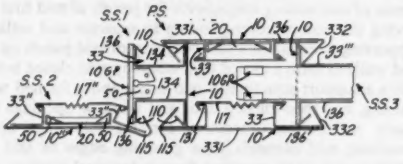
Rene Vincens, 82 A, Route de Geneve, 1028 Preverenges, Switzerland, assignor to Societe Anonyme pour l'Etude et la Promotion des Entreprises and Rene Vincens, both of, Switzerland, part interest to each

Filed Mar. 17, 1975, Ser. No. 559,230

Claims priority, application France, Mar. 20, 1974, 74 09394; Sep. 6, 1974, 74 30362; Mar. 13, 1975, 75 07902

Int. Cl.[2] E04C *2/40*

U.S. Cl. 52—580 **12 Claims**



1. A composite structure for use in the construction of buildings and of fixtures and appurtenances thereof, comprising, primary and secondary subassemblies interconnected with one another to provide a composite structure, each subassembly having;

a pair of walls each having a cross-sectional shape of a type selected from the shape of an L, a C, a U, and an Omega, each wall comprising, a wall web having two mutually opposite longitudinal edges, and a wall flange on each of the two longitudinal edges, said wall flanges extending transversely of the wall web to strengthen the wall and in effect to extend one of the walls of the other subassembly in the composite structure;

a pair of sleeves each having a generally C-shaped cross-sectional shape with one side thereof open toward the corresponding side of another one of the sleeves, each sleeve comprising a sleeve web having two mutually opposite longitudinal edges and each sleeve having a sleeve flange on each of the longitudinal edges of the sleeve web, each sleeve flange extending transversely of the sleeve at an acute angle to the sleeve web, while extending along and slidably edgewise engaging one of the mutually opposite wall flanges of the respective subassembly so as to enable the sleeves of each pair of sleeves to act as mutually opposite wall-tying members to interconnect walls of the primary and secondary subassemblies and thereby to effet the extending of the walls in the composite structure; and

bridge means disposed in the subassembly between the respective pair of walls and the respective mutually opposite wall-tying members of the pair of sleeves for rigidly bracing the subassembly against loads compressive of the bridge means to strengthen the composite structure.

4,114,342

THERMALLY AND ACOUSTICALLY INSULATING STRUCTURE

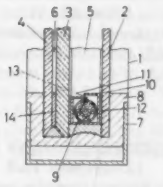
Taro Okawa, Tokyo, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,420

Claims priority, application Japan, Mar. 26, 1977, 52-36898[U]

Int. Cl.[2] E06B *7/12, 5/20*

U.S. Cl. 52—790 **8 Claims**



1. A thermally and acoustically insulative structure comprising:

a glazing frame;

a first sheet of glass sealed around all sides into said glazing frame;

a second sheet of glass sealed along all sides into said glazng frame parallel to and spaced from said first sheet, the space between said first and second sheets defining a first air-tight space;

a third sheet of glass sealed along all of its edges into said glazing frame parallel to and spaced from said second sheet, the space between said second and third sheets defining a second air space;

said second air space being a micro-air space defined by a very small distance between said second and third sheets;

said first air space being substantially wider than said second micro air space;

communication means in said second sheet open to said first and second air spaces for communicating said first and second air spaces with each other; and

contact-preventing means extending between and spaced from said second and third sheets in said second micro air space for preventing said second and third sheets from contacting each other due to wind deformation and for preventing the formation of Newton's Rings.

4,114,343

STACKING RACKS

Badger R. Bazen, Rte. #1, Box 163, Johnsonville, S.C. 29555

Filed Jun. 17, 1977, Ser. No. 807,688

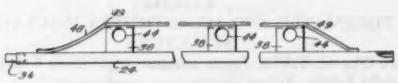
Int. Cl.[2] E04C *3/32*

U.S. Cl. 52—665 **4 Claims**

1. A protective frame for the wall of a structure of the type having a plurality of generally vertically extending beams for supporting the wall of the structure, said protective frame comprising a plurality of vertical posts extending from the floor of the structure and spaced apart between adjacent beams thereof with said posts being spaced a selected distance from the wall,

a plurality of generally horizontally extending cross members spaced apart vertically along said vertical posts and with said vertical posts being disposed between said cross members and the wall of the structure, each said cross member having one end secured to one of the adjacent beams and its other end secured to the other of the adjacent beams such that said posts and cross members define a grid structure of intersecting posts and cross members between the adjacent beams,

each of said cross members having reinforcing means includ-



ing means connecting each said cross member to a said vertical post at each intersection of a said post and a said cross member, said reinforcing means including a plurality of bracket members welded to each said cross member and evenly spaced therealong a distance corresponding to the distance between said vertical posts and a rod member having one end welded to said cross member adjacent one end thereof and its other end welded to said cross member adjacent to the other end thereof with said rod member in engagement with each of said bracket members located between the ends of said cross member.

4,114,344

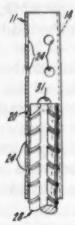
CONCRETE REINFORCEMENT SPLICE WITH LOCATION TAB

Edward E. Heasman, Epping, Australia, assignor to Imoco-Gateway Corporation, Chicago, Ill.

Filed Apr. 21, 1976, Ser. No. 679,068

Int. Cl.[2] E04C *3/30;* **E04G** *21/00;* **E04H** *12/16*

U.S. Cl. 52—741 **9 Claims**



1. The method of forming a rebar joint in a vertical column, wall, or like reinforced concrete body, comprising the following steps:

fabricating a clamp comprising a contractable metal sleeve having an unstressed internal diameter just large enough to receive a dowel rebar of given size and contraction means for contracting the sleeve, including the sub-step of forming a location tab, integral with the sleeve, having a free edge projecting upwardly and inwardly from the central portion of the sleeve at an acute angle;

sliding the metal sleeve onto the upper end of a lower dowel rebar until the tab engages the upper edge of the dowel rebar;

driving the metal sleeve further onto the upper end of the dowel rebar to bend the upper end of the location tab outwardly toward the sleeve until the free edge of the tab firmly engages the dowel rebar just below the upper edge of the rebar;

inserting an upper extension rebar into the sleeve until its lower end engages the upper end of the lower dowel rebar;

and contracting the sleeve, by means of the contraction means, to grip both the rebars tightly and thereby complete the rebar joint.

4,114,345

METHOD FOR THE PRODUCTION OF HOUSES

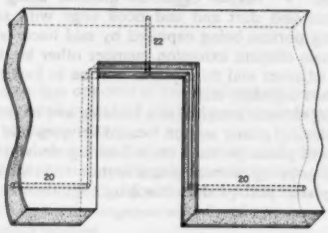
Walter Nilsen, Reistad, Norway, assignor to Den Norske Gipsplatefabrikk A/S, Toerkop p.a. Drammen, Norway

Continuation of Ser. No. 541,917, Jan. 17, 1975, abandoned, which is a continuation of Ser. No. 349,597, Apr. 9, 1973, abandoned, which is a continuation of Ser. No. 145,459, May 20, 1971, abandoned. This application Apr. 8, 1977, Ser. No. 785,904

Claims priority, application Norway, May 28, 1970, 2061/70

Int. Cl.[2] E04B *1/12;* **E04G** *21/14*

U.S. Cl. 52—745 **3 Claims**



1. A method of producing a house comprising forming a continuous web of a layer of foam plastic thermal insulation sandwiched between layers of gypsum board and in that forming process disposing longitudinally extending channels in said insulation and between said gypsum board layers, said channels being for the reception of conduits and, on a building site providing a plurality of rectangular panels of said web cut to form a first group of panels, securing nailing strips to edges of said panels, assembling said panels, in edge to edge relationship with said channels of adjacent panels registering with one another to form a continuous channel through said assembly, said panels when so assembled forming the walls of said house without door or window openings and uniting said walls by means of said nailing strips, with the panels of said first group having dimensions corresponding to separate said walls, then supporting a ceiling of a second group of said panels on top of said walls to form a closed box, whereby said closed box comprises a support structure of said house and is formed without framing, and then cutting door and window openings in said panels and in the process of forming said door openings breaching said channels, then grooving edges of said panels defining said door openings from a terminal portion of said channel at one side of the opening to a terminal portion of said channel at the other side of said opening to provide interconnections between said terminal portions of said channel at opposite sides of said door openings and then disposing conductor means within said channels and grooves formed in said edges of said door openings.

4,114,346

METHOD AND PRODUCT FOR INSTALLATION OF SHEET FLOORING

Edward G. Kelly, Allentown, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,391

Int. Cl.[2] E04F *13/20*

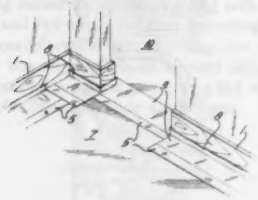
U.S. Cl. 52—746 **1 Claim**

1. A method of installing a sheet flooring comprising the steps of:

1. affixing to a floor to be covered with a sheet flooring material, a flexible sheet that follows the periphery of a floor and overlays adjacent walls of a room,

2. cutting the flexible sheet so that its outer edges match the outer dimensions of the room,

3. laying a sheet of flooring upon the flexible sheet,
4. removing an adhesive protective strip located on the flexible sheet and exposing an adhesive strip by picking up sections of the flooring, removing the adhesive protective strip and relaying that portion of the flooring until all the adhesive protective strip is removed,



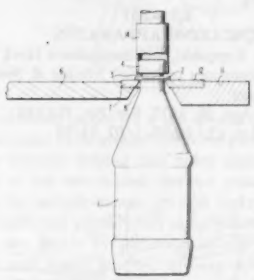
5. picking up the sheet flooring with the flexible sheet attached and cutting the flooring along the outer edges of the flexible sheet in order that the flooring is an exact match to the room,
6. relaying the flooring after removal of the flexible sheet.

4,114,347

CAPPING APPARATUS HAVING MEANS FOR CONVEYING CONTAINERS WHILE SUSPENDED BY A FLANGE

Frank R. Morris, Yardley, and Alfred C. Alberghini, Langhorne, both of Pa., assignors to Pepsico, Inc., Purchase, N.Y.

Filed May 9, 1977, Ser. No. 795,280
Int. Cl.[2] B65B *7/28*
U.S. Cl. 53—300 **7 Claims**



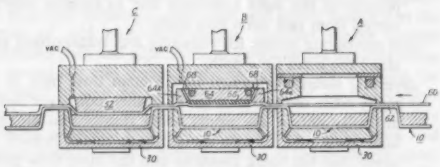
1. An apparatus for capping containers having a capping portion with a horizontally-enlarged flange, by the application of axial force to the capping portion of the containers, which comprises rotatable means having a plurality of container holding means positioned on the periphery of said rotatable means, said holding means having an outwardly facing open portion for receiving the containers, and providing first supporting means for supporting the underside of an inwardly positioned portion of the enlarged flange of the containers with a portion of the flange extending outwardly of said first supporting means, means for feeding the containers sequentially into said holding means so that the horizontally-enlarged flange on the capping portion of the containers is above said first supporting means, second stationary supporting means positioned outwardly of said rotatable means with a space therebetween, said rotatable means being suitable for transporting the containers on said first supporting means to said second stationary supporting means, means for supporting the lower portion of the containers as they move from said feeding means into the space between said rotatable means and said second supporting means, said first and second supporting means serving to suspend said containers by said flange and between said first and second supporting means, said second supporting means being spaced outwardly of said rotatable means opposite a substantial portion of the periphery of the rotatable means sufficient to permit capping of the containers while they are supported on and suspended from said first and second supporting means, said spacing being sufficient to permit movement of the containers between said rotatable means and said second supporting means as the containers are capped, means for capping said containers by the application of axial force when the containers are supported on and suspended from said first and second supporting means, said first and second supporting means being spaced relative to one another for engaging said flange to receive substantially all of said axial force applied by said means for capping said containers while simultaneously permitting said movement of said containers therebetween, and means for removing capped containers from said holding means before said holding means return to the container-feeding position.

4,114,348

PACKAGING TECHNIQUES FOR SEMI-RIGID PACKAGES

Reid A. Mahaffy, Montclair, and Joel A. Hamilton, Englewood, both of N.J., assignors to Mahaffy & Harder Engineering Co., Totowa, N.J.

Continuation of Ser. No. 683,256, May 5, 1976, abandoned, which is a division of Ser. No. 384,717, Aug. 1, 1973, Pat. No. 3,972,155, which is a division of Ser. No. 860,590, Sep. 24, 1969, Pat. No. 3,792,181. This application Sep. 19, 1977, Ser. No. 834,429
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—433 **19 Claims**



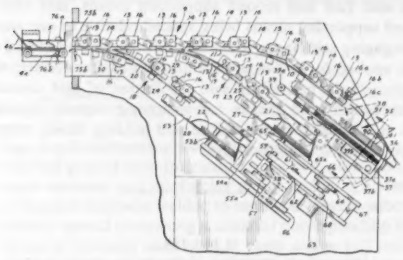
1. The method of packaging food products and the like, comprising the steps of:
- forming a first sheet of semi-rigid plastic material so as to develop a generally cup-shaped receptacle having a flange around the mouth thereof;
- placing in the formed receptacle cup a product having less depth than the cup, thereby providing at least a moderate amount of space between the top of the product and the mouth of the cup;
- advancing a second sheet of semi-rigid plastic material to said receptacle to provide a top therefor, said second sheet comprising material presenting a sealing surface to lie against said flange;
- heating at least a selected part of said second sheet interiorly of said sealing surface to forming temperature;
- applying pressure to said second sheet while still hot so as to stretch the heated part of the plastic material to form an inwardly-extending semi-rigid portion which in the completed package will engage the packaged product and hold it pressed against the bottom of the cup; and
- subsequent to said application of pressure to said heated part, evacuating the interior of said receptacle and hermetically sealing said top to said receptacle so as to develop an evacuated package;
- the semi-rigid characteristic of said inwardly-extending portion maintaining a firm pressure on the product after the plastic has cooled.

4,114,349

AUTOMATIC SORTING, CONVEYING AND PACKING MECHANISM FOR PHOTOGRAPHIC PRINTS

Gerald A. Jensen, Wayzata; Louis A. Larson, Minneapolis, and Robert E. Diesch, Rogers, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Apr. 11, 1977, Ser. No. 786,184
Int. Cl.[2] B65B 57/14
U.S. Cl. 53—54 16 Claims



1. A sorting, conveying, and packing mechanism particularly adapted for use with photographic print processing equipment, the mechanism comprising:

a cutting mechanism for cutting individual prints from a continuous roll of processed photographic prints;

a main conveyor line defining a main flow path for individual prints cut by the cutting mechanism;

means for feeding the individual prints into the main conveyor line;

a branch conveyor line defining a secondary flow path and having an entrance communicating with an intermediate portion of the main conveyor line to receive prints diverted from said main flow path;

first conveying means for engaging and transporting prints along the main flow path;

diverting means positioned in the main flow path to normally close the entrance to the branch conveyor line and normally permit the prints being transported along the main flow path to pass the entrance to the branch conveyor line but being movable into the main flow path to obstruct the main flow path and open the entrance of the secondary flow path and divert certain of the prints from the main flow path into the secondary flow path;

means for scanning classification indicia associated with the main flow path ahead of the entrance to the branch conveyor line;

actuating means for moving the diverting means into diverting position in response to a signal from the scanning means;

an accumulating station at a discharge end of the main conveyor line for collecting the prints which pass the entrance without being diverted;

means for positively engaging and ejecting the collected prints from the accumulating station into a packaging envelope; and

means for discharging from the branch conveyor line the prints diverted from the main conveyor line.

4,114,350

METHOD AND APPARATUS FOR ADJUSTING THE RESILIENCE OF A HOLLOW BALL HAVING AN INTERNAL PRESSURE

J. Gerald Snyder, 5911 Sherborne La., Springfield, Va. 22152

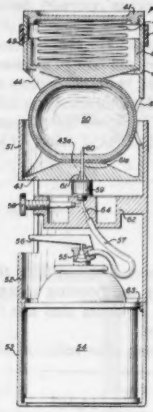
Filed Jun. 18, 1976, Ser. No. 697,460
Int. Cl.[2] A63B 41/12, 47/00; G01N 3/12, 3/14
U.S. Cl. 53—79 19 Claims

1. An apparatus for adjusting the resilience of a tennis ball having variable deflection characteristics, said apparatus comprising:

(a) means for holding said tennis ball in a confined position,

(b) aerosol container means for storing a mixture of an inflating medium and a sealant material,

(c) means for injecting said mixture from the aerosol container into said tennis ball,



(d) said holding means including means for maintaining the ball in a compressed condition under a compressive force directed against the ball to cause structural deflection of the ball in said confined position, and

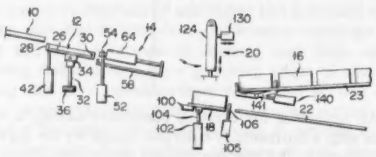
(e) gauge means responsive to said deflection for indicating the deflection characteristics of said compressed tennis ball when maintained under said compressive force.

4,114,351

ENCASING APPARATUS

Toshiki Morimoto, Kawasaki, and Sumisaburo Hori, Akishima, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1977, Ser. No. 791,864
Int. Cl.[2] B65B 5/10, 35/56
U.S. Cl. 53—157 15 Claims



1. An encasing apparatus for delivering and packing products or articles, hereafter referred to as articles, in a packing box or the like, comprising:

a feed mechanism to feed products or articles to be packed;

a turnabout mechanism located on the forward side in the feed direction of said feed mechanism for making a first alignment of said articles by locating a prescribed number of said articles successively in layers with said articles oriented in a first direction and for delivering said articles, kept subject to said first alignment, in a second direction perpendicular to said first direction after turning said articles through a predetermined angle, said turnabout mechanism including:

a tray having a rising wall along at least one edge thereof;

a vertical rotary shaft;

means for inclinably attaching said tray to the end of said vertical rotary shaft so that said tray turns with said rotary shaft;

means for selectively inclining said tray; and

means for driving said rotary shaft to rotate said tray and said articles through said predetermined angle;

a slide mechanism located at the outlet of said turnabout mechanism for receiving said articles and for making a second alignment of said articles to true up the ends of said articles in said second direction of said articles delivered from said turnabout mechanism, said slide mechanism including means for supporting said articles at said ends thereof and exit means for then delivering said articles in said second direction into a packing box; and

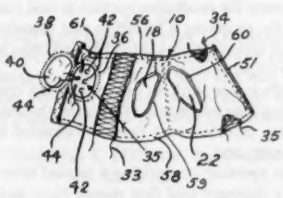
a packing box support means located adjacent said slide mechanism for supporting a packing box while it is receiving articles from said slide mechanism.

4,114,352

PROTECTIVE JACKET FOR CHRONICALLY INSTRUMENTED DOGS

Michael L. Horton, Greene County, Ohio, and Alan M. Harris, Aurora, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 19, 1976, Ser. No. 706,316
Int. Cl.[2] B68C *5/00;* **A01K** *27/00, 29/00*
U.S. Cl. 54—79 **2 Claims**



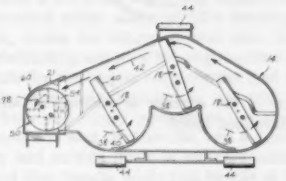
1. A protective jacket for a test animal comprising: a body member adapted to fit around the front part of the test animal; said body member having two holes adapted to receive the front legs of the test animal; fastener means for holding the jacket on the animal; means, on said jacket for adjusting the jacket for different animal body sizes; means on said jacket for adjusting the jacket for different animal body contours; a pouch on said jacket adapted to be positioned adjacent the withers of the test animal; means in said pouch for providing a passage for animal instrumentation leads into said pouch; means for securing instruments and instrumentation leads within said pouch; said pouch having a tear resistant cover; means for closing the cover on said pouch; said means for adjusting the jacket for different animal body sizes includes means for supporting a first row of eyelets on the outside of the jacket, extending from the front to the back of the jacket; means for supporting a second row of eyelets on the outside of the jacket substantially parallel to said first row, said second row of eyelets being spaced from first row of eyelets; means, passing through said eyelets for drawing said first row of eyelets toward said second row of eyelets to thereby reduce the size of the jacket; said means for adjusting the jacket for different animal body contours includes means for supporting a first group of eyelets in a V-shaped pattern at the forward portion of the jacket; means for supporting a second group of eyelets in a V-shaped pattern at rearward portion of the jacket; means, passing through said eyelet for drawing one side of each V-shaped pattern toward the other side of the corresponding V-shaped pattern to thereby adjust the jacket to the body contour of the animal.

4,114,353

TERRAIN TRAVERSING DEVICE HAVING IMPELLER MEANS FOR PROPELLING GRASS CLIPPINGS AND LEAVES INTO A RECEPTACLE

Donald I. Ansbaugh, Granger, and Glenn A. Heilman, Mishawaka, both of Ind., assignors to Heilman Enterprises, Inc., Mishawaka, Ind.

Filed Feb. 24, 1975, Ser. No. 552,537
Int. Cl.[2] A01D *35/22*
U.S. Cl. 56—13.3 **7 Claims**



1. In a device which includes a frame supported by wheels for movement over the terrain, a cutter blade housing carried by said frame and including a discharge opening, rotating cutter means within said housing and positioned adjacent said terrain for cutting grass or picking up leaves and causing the clippings of said grass or said leaves to be collected within said housing and ejected therefrom through said housing discharge opening, means for rotating said cutter means, the improvement wherein said device includes receptacle means for collecting said clippings or leaves as they are ejected from said cutter housing, conduit means extending between said housing discharge opening and receptacle means defining in conjunction with said housing a path from said cutter means into the interior of said receptacle means, impeller means located within said path and adjacent said cutter means for contacting and propelling said discharged clippings or leaves along the remainder of said path into the interior of said receptacle means, means for rotating said impeller means, said housing including a top and side wall joining said conduit means, said housing supporting said impeller means at the discharge opening therein and adjacent said housing side wall, vertically oriented shaft means supporting each cutter means and said impeller means for rotation in a plane generally paralleling said terrain, said impeller means including a disk-shaped wall part carried by said shaft means, said wall part lying in substantially the same plane as the plane of rotation of said cutter means, said impeller means wall part positioned adjacent said housing side wall and conduit means and defining a substantially continuous lower wall means from said housing discharge opening to said conduit means for conducting said discharged clippings or leaves into said conduit means, said impeller means wall part including an upper surface, a plurality of blade parts carried upon said upper surface and extending generally radially outwardly from said wall part supporting shaft means to contact and propel said discharged clippings or leaves through said conduit means and into said receptacle means.

4,114,354

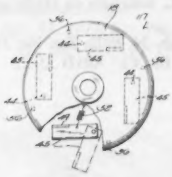
LAWN MOWER BLADE MOUNTING

Richard L. Morris, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 5, 1976, Ser. No. 739,322
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **24 Claims**

1. A lawn mower comprising a blade housing, a member adapted for rotation within said blade housing and having a peripheral edge, a blade movably secured to said member for movement between a retracted position wherein said blade is positioned inwardly of said peripheral edge, and an extended

position wherein said blade extends outwardly beyond said peripheral edge, and means for biasing said blade to said re-



tracted position in the absence of rotation of said member above a predetermined speed.

4,114,355

APPARATUS FOR THE PRODUCTION OF WRAPPERS

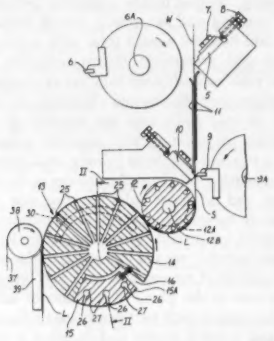
Robert William Davies, and Barry George Applegate, both of London, England, assignors to Molins Limited, London, England

Filed Feb. 7, 1977, Ser. No. 766,153

Claims priority, application United Kingdom, Feb. 5, 1976, 4480/76

Int. Cl.[2] B65B *41/06, 41/16;* B26D *7/06*

U.S. Cl. 53—389 **10 Claims**



1. Apparatus for producing two-piece wrappers wherein said pieces are of unequal length, for wrapping articles such as groups of cigarettes, said apparatus comprising:

(a) means for continuously feeding a web of wrapper material along a single path,

(b) a pair of cutters spaced along said path,

(c) conveyor means along said path spaced downstream from said cutters, and movable at the speed at which said feeding means feeds said web, for sequentially receiving and conveying cut wrapper pieces, and

(d) means for operating said cutters in timed relationship with the speed of said conveyor means such that said cutters alternately cut said web into pieces of unequal length and each newly cut end of said web is engaged by said conveyor means prior to the next cutter cutting the next piece from said web,

(e) said conveyor means comprising a suction roller having means for applying suction thereto from the point at which said newly cut end of the web is engaged by said roller.

4,114,356

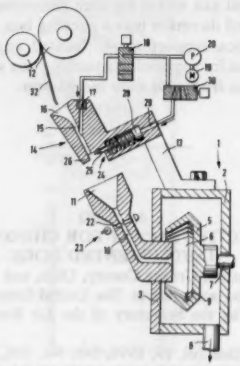
OPEN-END SPINNING APPARATUS

Friedrich Eckhardt, Salach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Aug. 5, 1976, Ser. No. 711,721

Int. Cl.[2] D01H *15/00, 1/12*

U.S. Cl. 57—34 R **3 Claims**



1. In an open-end spinning machine which includes at least one spinning chamber and rotatably mounted therein a spinning rotor, means for producing suction in said chamber, apertured means for receiving a thread in said chamber and transport means for transporting a thread to and from said spinning chamber, the improvement comprising:

thread guide means with an exit orifice for compressed air and having a terminus and a first bore, the axis of said first bore being directed to a draw-off channel in said apertured means; and

an injection aperture comprising a second bore arranged to obliquely intersect said first named bore and thread cutting means supported relative to said first bore, said cutting means being movable to intersect said thread as it is emitted from said exit orifice.

4,114,357

THREAD-WETTING ARRANGEMENT FOR YARN-TWISTING APPARATUS

Aloys Greive, Munster, Germany, assignor to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed Jun. 17, 1977, Ser. No. 807,649

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627268

Int. Cl.[2] D01H *13/30, 7/86*

U.S. Cl. 57—35 **11 Claims**

1. A yarn-twisting apparatus comprising:

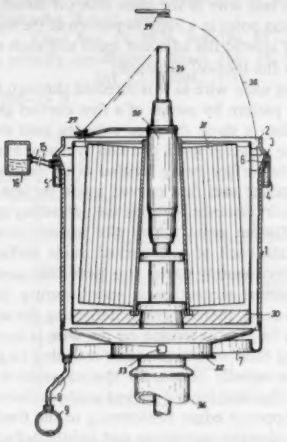
a stationary support for a yarn package centered on an upright axis;

a thread-guiding structure rotatable about said axis including a hollow spindle traversing said support and terminating in an open top for receiving a thread drawn upwardly from said yarn package, said structure further including a payoff disk on said spindle below said support having a generally radial outlet for said thread;

a balloon-limiting cylinder surrounding said structure and said support, said cylinder having an inner wall surface positioned to surround said yarn package with clearance for the upward guidance of the thread exiting from said outlet and revolving with said structure;

conduit means communicating with a supply of treatment liquid and opening onto said inner wall surface at an elevated zone close to the top of said cylinder periodically

swept by the revolving thread for saturating same with said liquid; and



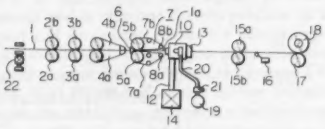
a receptacle for excess liquid extending inwardly of said inner wall surface over the entire periphery of said cylinder at the bottom thereof.

4,114,358

METHOD AND APPARATUS FOR COMMENCING THE YARN FORMING OPERATION OF A FASCIATED YARN

Nobuo Tsuchida; Tadashi Kohara, both of Otsu; Syozo Morishita, Kyoto; Seiichi Yamagata, and Masaaki Sakai, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 6, 1977, Ser. No. 794,545
Int. Cl.[2] D01H 5/28
U.S. Cl. 57—51 **17 Claims**



1. Method for commencing a yarn forming operation of a fasciated yarn comprising a twistless core bundle of staple fibers and outside fibers wrapped around said core bundle of fibers by an apparatus provided with a mechanism for supplying a bundle of fibers, a mechanism for forming said yarn from a bundle of fibers supplied thereinto from said supply mechanism and a mechanism for taking up said yarn from said yarn forming mechanism, said supply mechanism being provided with at least a nip point for stably controlling said bundle of fibers at a position facing said yarn forming mechanism, said yarn forming mechanism being provided with a fluid nozzle for creating an eddy current fluid stream therein so that false twists are imparted to said core bundle fibers delivered from said supply mechanism at a position between said nip point and said fluid nozzle, and a suction means for controlling said outside fibers in united condition with said false twisted fiber bundle while said bundle of fibers is introducing into said fluid nozzle, said fluid nozzle being provided with a fluid conduit for receiving compressed fluid thereinto; an improvement comprising, commencing a yarn forming operation in a condition wherein a distance between said nip point of said supply mechanism and a most upstream position in said fluid nozzle where said compressed fluid is ejected thereinto is shortened to a predetermined length which is shorter than a normal distance for carrying out a normal yarn forming operation by displacing said fluid nozzle, carrying out an initial yarn forming operation for a short time in a condition of said shortened distance and, thereafter carrying out said yarn forming operation in a condition wherein said distance is said normal distance.

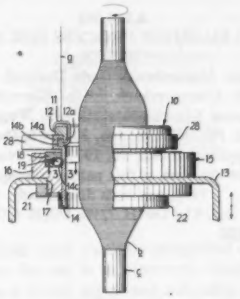
5. In an apparatus for manufacturing a fasciated yarn comprising a twistless core bundle of staple fibers and outside fibers wrapped around said core bundle fibers, provided with a mechanism for supplying a bundle of fibers and a mechanism for forming said yarn from said bundle of fibers supplied from said fiber supply mechanism, said supply mechanism being provided with a nip point where said bundle of fibers can be stably controlled when a normal yarn forming operation is carried out, means for taking up said yarn from said yarn forming mechanism, said yarn forming mechanism comprising a fluid nozzle for creating an eddy current fluid stream therein so that false twists are imparted to said core bundle fibers delivered from said supply mechanism at a position between said nip point and said fluid nozzle, and a suction means for controlling said outside fibers in united condition with said false twisted fiber bundle while said bundle of fibers is introducing into said fluid nozzle, said fluid nozzle being provided with a fluid conduit for receiving compressed fluid thereinto; an improvement comprising, means for holding said fluid nozzle in a condition wherein said means is capable of displacing said fluid nozzle towards said fiber bundle supply mechanism at the time when the initial yarn forming operation is carried out and means for stably positioning said fluid nozzle at a position where a normal yarn forming operation is carried out.

4,114,359

DRIVEN SPINNING RING DEVICE FOR YARN MACHINES

Rufino Creus, Sabadell, Spain, assignor to Spurmach Espana S. L., Sabadell, Spain

Filed Mar. 2, 1976, Ser. No. 663,121
Claims priority, application Spain, Mar. 15, 1975, 435.657
Int. Cl.[2] D01H 7/58
U.S. Cl. 57—124 **10 Claims**



1. A spinning ring device for a yarn machine comprising a traveler for guiding yarn in a winding operation about a winding axis, a support ring for the traveler for guiding it in a circular path around the winding axis under the influence of the yarn, a mounting for supporting the ring on the winding axis, a ring holder rotatably mounted in said mounting to enable the ring to rotate in the same direction as the traveler to decrease the relative movement between the ring and the traveler, a stationary bearing support accommodated by the mounting and receiving the ring holder rotatably therein, bearing means interposed between said stationary bearing support and said ring holder to permit the ring holder to rotate within said bearing support, a pair of drive transmitting surfaces formed on the ring holder, driving means in engagement with one of said surfaces for driving the ring holder and driven

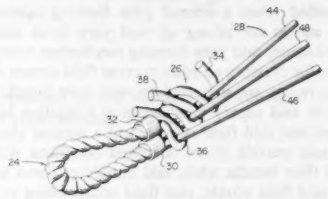
means in engagement with the other of said surfaces for transmitting drive from the ring holder to at least one other ring holder.

4,114,360

PIGGING STRING AND METHOD OF MANUFACTURE

Johnny Dale Emmons, Rte. 3, Box 97-A-4, Mansfield, Tex. 76063

Filed May 9, 1977, Ser. No. 794,939
Int. Cl.[2] D02G *3/44*; B65H *69/06*
U.S. Cl. 57—142 **11 Claims**



1. An improved pigging string of the type including a plurality of core filaments twisted into an elongated rope section of fixed length with a loop secured at one end thereof wherein said improvement comprises:

a first length of core filaments tautly twisted into an intermediate loop section and being reversed upon itself;

said loop section being intermediate of second and third core filament sections;

said second core filament section being substantially shorter than said third core filament section and each of said second core filaments being looped around a single associated one of said third core filaments and folded back upon itself;

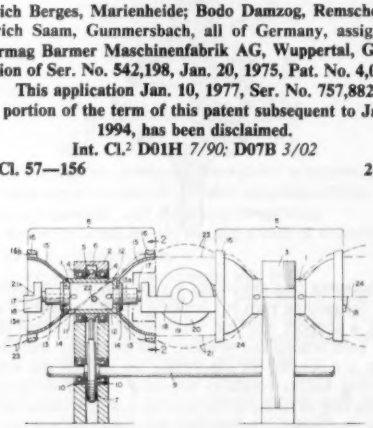
said third core filament section being tautly twisted adjacent said loop section for securing said untwisted, looped and folded core filaments of said second core filament section securely thereagainst.

4,114,361

TWISTING MACHINE PROCESS FOR STRANDING WIRES

Dietrich Berges, Marienheide; Bodo Damzog, Remscheid, and Ulrich Saam, Gummersbach, all of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Wuppertal, Germany

Division of Ser. No. 542,198, Jan. 20, 1975, Pat. No. 4,002,015.
This application Jan. 10, 1977, Ser. No. 757,882
The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.
Int. Cl.[2] D01H *7/90*; D07B *3/02*
U.S. Cl. 57—156 **2 Claims**



1. A process for twist stranding a plurality of wires in a high-speed stranding machine which comprises:

withdrawing said wires from a corresponding plurality of feed spools arranged at spaced intervals on a common stranding axis;

guiding the wire from each of said feed spools first to a deflection point located on said common stranding axis in front of each spool position;

directing each said wire in the same take-off direction from said deflection point in a balloon pattern at the same rotational speed around the adjacent spool and each succeeding spool in the take-off direction;

further guiding each wire as it is directed through its rotating balloon pattern by means of a first curved guide surface extending a short distance between said deflection point and the adjacent spool and also by means of a second curved guide surface being located at an axially spaced interval opposite said first curved guide surface and extending a short distance between the preceding spool and the next adjacent point where the balloon crosses the stranding axis, each of said curved guide surfaces conforming approximately to the free path generated by the rotating balloon around each spool during the twist stranding process, thereby gently deflecting the wire from within each balloon as tension on the wire is increased;

further guiding each wire by an outer retaining ring surface located at a radially outwardly spaced position around each of said first and second curved guide surfaces at their outermost opposed edges conforming to the freely rotating balloon, thereby contacting and lightly deflecting the wire at a point along the outside of each balloon as the tension on the wire is decreased; and

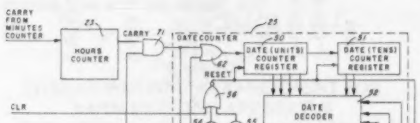
conducting said wires in said balloon pattern free of peripheral limitation or restricted movement aside from said first and second curved guide surfaces and said retaining ring surfaces.

4,114,362

ELECTRONIC TIMEPIECE

John E. Frederiksen, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 14, 1977, Ser. No. 777,382
Int. Cl.[2] G04B *19/24*; G04C *3/00*
U.S. Cl. 58—4 A **10 Claims**



1. An electronic timepiece having a timekeeping mode, in which said timepiece is in its normal operating mode for indicating time, and a timesetting mode, in which said timepiece is manually settable to a selected indication of time, said electronic timepiece comprising:

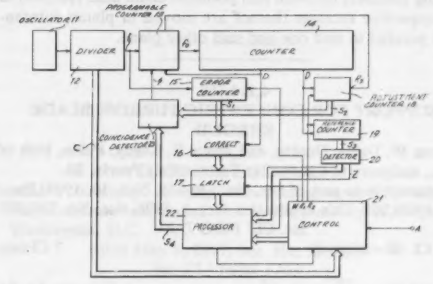
(a) means for indicating a plurality of time-related functions including the month and date; and

(b) means for advancing said indicating means from February 28 to March 1 when the electronic timepiece is in said timekeeping mode and for allowing said indicating means to be manually advanced from February 28 to February 29 when the electronic timepiece is in the timesetting mode.

4,114,363
ELECTRONIC TIMEPIECE

Yoichi Imamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 18, 1976, Ser. No. 697,593
Claims priority, application Japan, Jun. 18, 1975, 50-73945
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 R 9 Claims



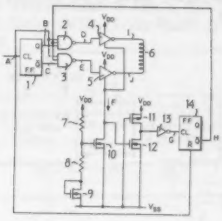
1. In an electric timepiece having timing rate circuit means including oscillator means for producing a high frequency time standard signal and divider means for producing a low frequency timekeeping signal, said divider means including a plurality of series-connected divider stages, each said divider stage being adapted to produce an intermediate frequency signal, and counter means for receiving said low frequency timekeeping signal and in response thereto being adapted to produce elapsed time signals representative of the time counted thereby, the improvement comprising error counting means coupled to one of said divider stages for receiving an intermediate frequency signal produced thereby over a randomly selected reference period, a reference counter coupled to said counter means for receiving one of said elapsed time signals produced thereby for said randomly selected reference period and in response thereto being adapted to produce a reference count signal, adjustment counter means adapted to receive one of said elapsed time signals produced by said counter means and in response thereto produce an adjustment count signal and processing means for comparing said error signal and said reference count signal and in response thereto, said processing circuit being adapted to produce a rate adjustment signal, said processing means further including coincidence means for detecting coincidence between said adjustment count signal and said rate adjustment signal and in response to said coincidence therebetween apply a frequency adjusting signal to said timing rate circuit means to regulate the timing rate of said low frequency timekeeping signal produced thereby.

4,114,364
DRIVING PULSE WIDTH CONTROLLING CIRCUIT FOR A TRANSDUCER OF AN ELECTRONIC TIMEPIECE

Norio Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 28, 1977, Ser. No. 763,714
Claims priority, application Japan, Jan. 29, 1976, 51-8631
Int. Cl.[2] G04C 3/00; H02P 7/00
U.S. Cl. 58—23 D 4 Claims

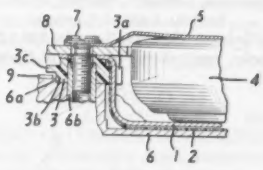
1. In an analogue electronic timepiece, the combination of a transducer comprising a rotor, a stator and a driving coil, means including a power source for periodically supplying to said driving coil electric pulses of a selected width to drive the rotor and means for automatically controlling the pulse width according to the load of the transducer and thereby reduce power comsumption, said pulse supplying means comprising two transducer driving inverters of which the outputs are connected respectively to opposite terminals of said driving coil, means supplying a clock signal, a first flip-flop having Q, Q and CL terminals, a second flip-flop having Q, CL and R terminals, a first NAND circuit having output terminal connected with one of said transducer driving inverters and three inputs connected respectively with said clock signal supply means, the Q terminal of said second flip-flop and the Q terminal of said first flip-flop, and a second NAND circuit having an output connected to the other transducer driving inverter and three inputs connected respectively with said clock signal supply means, said Q terminal of said second flip-flop and the Q terminal of said first flip-flop.



4,114,365
BATTERY LEAD PLATE MEMBER FOR AN ELECTRONIC WRIST WATCH

Eiichi Matsuura; Keikichi Takahashi; Nobuo Tsukada, and Yoshio Tatsumi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 3, 1976, Ser. No. 747,188
Claims priority, application Japan, Dec. 5, 1975, 50-165096[U]
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 BA 3 Claims

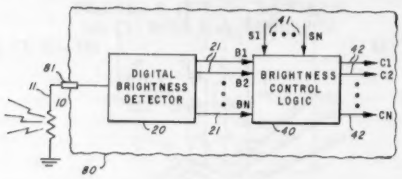


1. A battery lead plate assembly comprised of a one-piece integral structure for use in an electronic timepiece for connecting together a circuit block and a battery: said assembly comprising a casing composed of electrically insulative material and having means for connecting said casing to the circuit block and having a slotted arm portion; a lead plate element composed of electrically conductive material and having an end portion thereof inserted into the slot defined by said slotted arm portion and being configured so as to contact and make electrical connection between the circuit block and battery; and an insulating plate composed of electrically insulative material and having an end portion thereof inserted into said slot defined by said slotted arm portion and being configured so as to extend along the side of said lead plate element opposite the battery to thereby electrically insulate said lead plate element from other parts of the timepiece; said casing, lead plate element and insulating plate being integrally bonded into a one-piece structure to facilitate incorporation into and assembly of the timepiece.

4,114,366
DIGITAL BRIGHTNESS CONTROL SYSTEM

Karl H. Renner, Dallas, and Clark Russell Williams, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1976, Ser. No. 710,524
Int. Cl.[2] G04B *19/30*; G04C *3/00*; H05B *37/02, 39/04*
U.S. Cl. 58—50 R **19 Claims**

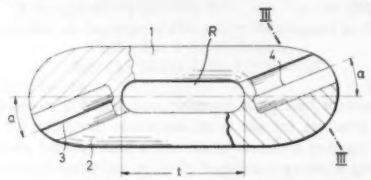


1. An electronic digital timekeeping device comprising:
(a) time display means;
(b) timekeeping circuitry means coupled to said display means for generating time signals for display by said display means;
(c) light sensor means;
(d) digital brightness detector means coupled to said light sensor means, said detector means including:
(i) a current source means, and
(ii) a plurality of semiconductor voltage level detector means with each of said voltage level detector means having an analog input coupled to said current source means, a unique switching threshold, and a digital output representative of the quantum of light detected by said light sensor means; and
(e) brightness control logic means coupled to said detector means for controlling the brightness of said display according to the digital outputs of said plurality of voltage level detector means.

4,114,367
LOCKING ELEMENT FOR CONNECTING CHAIN LINKS

Egon Verse, Iserlohn, Germany, assignor to Fa. August Thiele, Iserlohn-Kalthof, Germany

Filed Jul. 29, 1977, Ser. No. 820,127
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638443
Int. Cl.[2] F16G *15/04*
U.S. Cl. 59—85 **13 Claims**

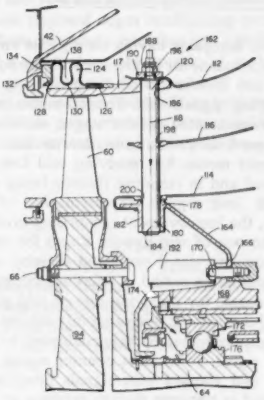


1. A locking element for connecting two chain links with one another, comprising two elongated locking members each having a recess and one and another end portion which are spaced from each other, the one end portion of one of said locking members being slidably and releasably engageable with the other end portion of the other locking member, and vice versa, in one and another plane which are parallel to one another and are inclined lengthwise of but in an oblique direction relative to the elongation of said locking members, said locking members being slidably movable relative to one another in said oblique direction between an engaged position in which the one end portion of one of said locking members engages the other end portion of the other of said locking members, and vice versa, in said one and other plane, respectively, and the recesses of said locking members together form an inner circumferentially closed recess in which the chain links can move, and a disengaged position in which the respective end portions of the locking members are disengaged from each other so that the chain links can be withdrawn from said inner recess, said one and said other plane being so offset relative to one another that during sliding movement of said locking members between said positions chain links received in the respective recesses thereof are moved in planes substantially parallel to said one and said other plane.

4,114,368
SUPPORT FOR CONCENTRIC TURBINE BLADE SHROUD

Warren W. Davis, Dunlap, and David E. Keedy, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 630,476, Nov. 10, 1975, Pat. No. 4,030,288. This application Oct. 1, 1976, Ser. No. 728,670
Int. Cl.[2] F02C *7/20*
U.S. Cl. 60—39.16 R **7 Claims**



1. In a gas turbine engine which comprises a gasifier module within a case, a power output module fixedly attachable to said case in position to receive exhaust gases exiting a combustor and passing via a gasifier turbine portion of said gasifier module to drive a power turbine having a turbine shroud about a plurality of blades of said turbine and thereby to drive a shaft of said power output module an improved turbine shroud support assembly, comprising;
a plurality of struts radially extending outwardly adjacent said power turbine, said struts supporting at a plurality of outer ends thereof said turbine shroud in fixed closely spaced concentric relation about said plurality of turbine blades, said struts supporting at said outer ends thereof an outer shroud which is positioned to direct the flow of said exhaust gases away from said blades of said power turbine;
a stationary bearing carrier surrounding and supporting an outer race of a bearing, an inner race of said bearing contacting said power turbine shaft;
inner support means fixed to said bearing carrier;
a plurality of sleeves, each having an axis generally radially extending from said shaft supported by said inner support means, said inner ends of each of said struts fitting in tight but slidable relation within a respective one of said sleeves, said turbine shroud including a plurality of holes therethrough in one-to-one relation with said plurality of struts, each of said struts fitting in a respective one of said holes in tight but slidable relation; and
a plurality of fastening means in one-to-one relation with said plurality of struts, each of said fastening means fasten-

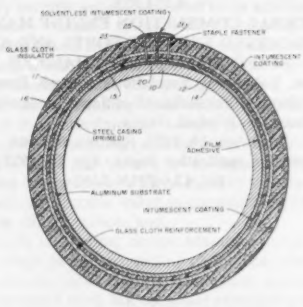
ing said turbine shroud to a respective one of said struts, each of said struts being movable radially inwardly toward said shaft and out of the respective holes when the respective fastening means is detached to allow removal of said turbine shroud without removal of a turbine rotor which supports said blades and is driven by said shaft.

4,114,369

COOK-OFF COATING

Donald P. Crowley, Lowell, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,165
Int. Cl.[2] F02K *1/00*
U.S. Cl. 60—200 A **23 Claims**



1. An ablative and flexible high strength insulative cook-off coating composite-sheet for providing a heat transfer inhibiting barrier as protection against fire and high temperatures, comprising:

a. a metal foil substrate having one surface thereof operable to be affixed to a device to be protected from excess heat;

b. a first layer of intumescent composition material adjacent to and affixed to the other surface of said metal foil substrate;

c. a glass cloth reinforcement layer having one side thereof affixed to the surface of said first layer of intumescent material;

d. a second layer of intumescent material affixed to the other side of said glass cloth; said second layer of intumescent material being of greater thickness than said first layer;

e. said glass cloth reinforcement layer being embedded between said first and second layers of intumescent material; said glass cloth reinforcement layer being operable to strengthen said flexible composite-sheet and prevent fissuring of the intumescent material layers upon charring of the intumescent material and prevent char failure of said composite-sheet due to flame and high temperatures produced by combustion of rocket propellants and the like;

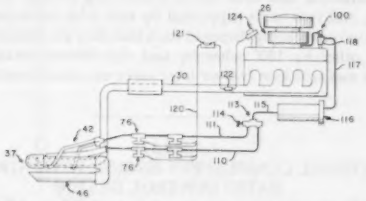
f. said composite layers of aluminum foil, intumescent composition material and glass cloth being flexible and providing an ablative insulating covering which inhibits heat transfer and provides insulation for safety purposes over a desired period of time; said period of time operable to be varied by varying the overall thickness of the composite-sheet, particularly the overall thickness of said first and second intumescent material layers.

4,114,370

EXHAUST GAS RECIRCULATION MEANS

Claude A. Woods, Fairacres, N. Mex., assignor to Woods Enterprises, Inc., Las Cruces, N. Mex.

Continuation of Ser. No. 689,805, May 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,882, Mar. 12, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,244
Int. Cl.[2] F02M *25/06;* **F02B** *75/10;* **F01N** *3/02;* **B01D** *45/18*
U.S. Cl. 60—279 **9 Claims**



4. An exhaust gas treatment system for a combustion chamber, comprising

an exhaust conduit from a combustion chamber,

a gas sampler for removing selected gases from the flow of gas from the combustion chamber and returning them to the combustion chamber, while allowing passage of other gas therethrough, said gas sampler including a solid wall tubular member having solid wall tubular passageways extending therefrom for returning removed selected gases to the combustion chamber,

a static structure connected between said conduit and said sampler, and consisting of a first pipe section; a second pipe section disposed at substantially 90° with respect to said first pipe section and forming a square elbow therewith; and a third pipe section substantially parallel to said first pipe section and disposed at substantially 90° with respect to said second pipe section and forming a square elbow therewith; said first and third pipe sections disposed in a substantially common plane that is between horizontal and about ± 10° from horizontal, and

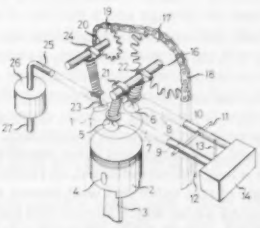
said static structure being directly connected between said conduit and said sampler, a linear connection being provided between said static structure third pipe section and said sampler, and in fluid-communicating relationship with both said conduit and said sampler.

4,114,371

INTERNAL COMBUSTION ENGINE

Munekazu Matsuda, Nishinomiya, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 31, 1976, Ser. No. 672,333
Claims priority, application Japan, Apr. 22, 1975, 50-49501
Int. Cl.[2] F02M *13/02;* **F02B** *75/10*
U.S. Cl. 60—282 **6 Claims**



1. An internal combustion engine comprising a cylinder, rich fuel-air mixture supply means for supplying rich fuel-air mixture to said cylinder, lean fuel-air mixture supply means for supplying lean fuel-air mixture to said cylinder, a rich fuel-air

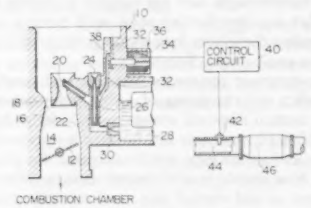
mixture inlet valve mounted on said cylinder and communicating with said rich fuel-air mixture supply means, a lean fuel-air mixture inlet valve mounted on said cylinder and communicating with said lean fuel-air mixture supply means, an exhaust valve mounted on said cylinder, an exhaust gas thermal reactor communicating with said exhaust valve, means for actuating said inlet valves, and means for actuating said exhaust valve, said rich fuel-air mixture inlet valve and said lean fuel-air inlet valve being actuated alternately whereby rich mixture and lean mixtures can be alternately supplied to the cylinder, said means for actuating said inlet valves comprising an inlet valve cam shaft, and two cams supported by said inlet valve cam shaft, said two cams being disposed such that they are displaced from each other by 180° whereby said rich fuel-air mixture inlet valve and said lean fuel-air inlet valve can be alternately actuated.

4,114,372

INTERNAL COMBUSTION ENGINE WITH AIR-FUEL RATIO CONTROL DEVICE

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 11, 1976, Ser. No. 694,970
Claims priority, application Japan, Jun. 13, 1975, 50-81026[U]
Int. Cl.[2] F02B *75/10*; F02D *35/00*
U.S. Cl. 60—276 **6 Claims**



1. An internal combustion engine having a cylinder in which a combustion chamber is defined by a cylinder head and a piston crown, comprising:

a carburetor including a throttle valve, a venturi portion upstream of the throttle valve, a main discharge nozzle opening to the venturi portion, a float bowl, a main jet, a main well communicating with the main discharge nozzle opening to the venturi portion disposed upstream of the throttle valve of said carburetor, the main well being communicating through the main jet with the float bowl of said carburetor, means defining a main air bleed orifice connected to said main well for communicating between the atmosphere and said main well, means defining a first additional air passage connected to said main well, a diaphragm defining an atmospheric chamber into which said first additional air passage opens, means defining a second additional air passage communicating between said atmospheric chamber and the atmosphere, means defining an air induction passage connecting a portion of said first additional air passage and a portion of said second additional air passage, means defining an orifice disposed within said air induction passage, a valve seat disposed at a portion where said first additional air passage opens to said atmospheric chamber, a valve member secured to said diaphragm to open and close the opening formed through said valve seat, the opening communicating with said first additional air passage, said valve member having a portion which is magnetically affected, an electromagnet disposed opposite of said valve seat with respect to said diaphragm and having a core which attracts said valve member in the direction to detach from said valve seat to establish communication between said first and second additional air passages when said electromagnet is energized, and a spring member disposed to urge said valve member in the direction to contact with said valve seat for blocking the communication between said first and second additional air passages when said electromagnet is de-energized; and

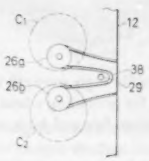
control means to place said electromagnet into a first state wherein the energizing time rate of said electromagnet is increased to a rate greater than a predetermined rate to make leaner the air-fuel ratio of the air-fuel mixture fed into the combustion chamber toward a predetermined level when the exhaust gases of the engine have a first composition representing that the combustion chamber is fed with an air-fuel mixture of the air-fuel ratio richer than the predetermined level, and into a second state wherein the energizing time rate is decreased to a rate less than the predetermined rate to make richer the air-fuel ratio of the air-fuel mixture fed into the combustion chamber toward the predetermined level when the exhaust gases of the engine have a second composition representing that the combustion chamber is fed with the air-fuel mixture of the air-fuel ratio lean than the predetermined level.

4,114,373

INTERNAL COMBUSTION ENGINE HAVING SIAMESED EXHAUST PORTS AND AN AFTERCOMBUSTION CHAMBER

Yasuo Sakai, Yokohama; Yasuhiko Nakagawa, Kamakura, and Yasuo Nakajima, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 14, 1976, Ser. No. 676,664
Claims priority, application Japan, Apr. 15, 1975, 50/45554
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—282 **11 Claims**



1. An internal combustion engine comprising:

a cylinder block;

a cylinder head positioned atop said cylinder block to define therebetween two combustion chambers which are respectively communicable with two exhaust port passages opening to the atmosphere at one side of said cylinder head, said exhaust port passages being arranged to neighbour each other;

a bolt member fastening said cylinder head to said cylinder block by passing through a bolt hole which is formed in said cylinder head at a position between said two exhaust port passages near one side of said cylinder head;

exhaust port liner means covering the surface of each exhaust port passage for preventing temperature drop of the exhaust gases passing therethrough;

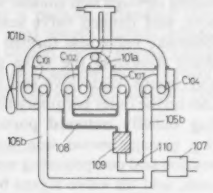
an exhaust manifold having inlet and outlet openings which are fluidly communicated with an aftercombustion chamber formed in said manifold, said inlet opening being connected to both of said two exhaust port passages so as to introduce the exhaust gases emitted from said combustion chambers into said aftercombustion chamber for re-combustion of the same; and

an exhaust manifold liner covering the inner surface of said exhaust manifold for preventing temperature drop of the exhaust gases passing therethrough.

4,114,374
INTERNAL COMBUSTION ENGINE

Toshio Tanahashi, Toyoda, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 20, 1976, Ser. No. 678,647
Claims priority, application Japan, Nov. 14, 1975, 50/137423
Int. Cl.[2] F02B 75/10; F02M 13/06; F02D 9/00
U.S. Cl. 60—302 10 Claims



1. An internal combustion engine for an automobile comprising:

a plurality of cylinders;

a primary intake system communicating with at least one of said cylinders and having a primary carburetor and a primary throttle valve connected to an accelerator pedal;

a secondary intake system communicating with the remainder of said cylinders and having a secondary carburetor and a secondary throttle valve, said secondary carburetor having a main fuel passage therein;

a device for controlling said secondary throttle valve adapted for maintaining said secondary throttle valve in the vicinity of its idling position when said primary throttle valve is in the vicinity of its idling position, while allowing said secondary throttle valve to fully open after said primary throttle valve is considerably turned away from its idling position; and,

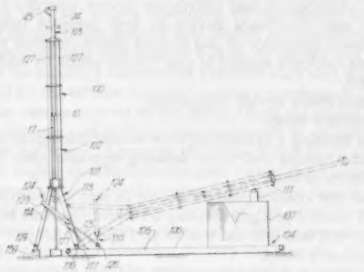
a fuel supply controlling device adapted to close said main fuel passage in said secondary carburetor when said primary throttle valve is open to an extent narrower than a predetermined level, but open said main fuel passage upon further opening of said primary throttle valve to at least said predetermined level, said fuel supply controlling device comprising a diaphragm valve provided in said main fuel passage and having two negative pressure chambers and a pair of passages, one of which connects one of said negative pressure chambers with an intake manifold in said primary intake system, while the other passage connects the other negative pressure chamber with an intake manifold in said secondary intake system.

4,114,375
PUMP JACK DEVICE

Minoru Saruwatari, Calgary, Canada, assignor to Canadian Foremost Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 699,134, Jun. 23, 1976, Pat. No. 4,047,384. This application Sep. 9, 1977, Ser. No. 832,046
Claims priority, application Canada, Apr. 9, 1976, 249962
Int. Cl.[2] F15B 9/02
U.S. Cl. 60—372 9 Claims

1. A pump jack comprising a double acting equal displacement, through rod type piston and cylinder motor; means for connecting a piston rod of said motor to a polished rod in a well head; said motor being arranged to be mounted above said well head and coaxial with said polished rod; a variable displacement type hydraulic pump having a pair of output ports; a pair of hydraulic conduits each placing one of said output ports in communication with an opposite end of said motor and forming a closed hydraulic loop with said motor and pump; drive means for said pump; a pump control means for controlling the direction and volume of flow in said loop to thereby determine the length and position of the stroke and the velocity of said piston rod; a compressible fluid counterbalance means for accumulation of energy during a down stroke of said piston rod and returning said energy to said piston rod during an up stroke of said piston rod; said counterbalance means including a cylinder having a piston with means connecting the piston thereof to the piston of said motor for drive therewith, said cylinder and piston forming a chamber containing a gaseous charge disposed to be compressed by the piston of said counterbalance means during the downward stroke of said

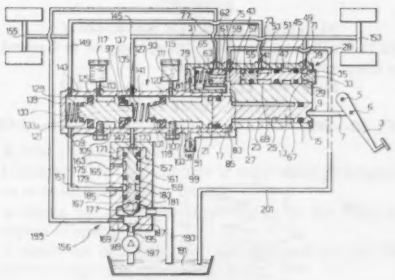


polished rod, said counterbalance means including an additional closed chamber means in communication with said chamber formed by said cylinder and piston, and the cylinder of said counterbalance means being coaxially mounted with said motor, said piston of said counterbalance means being directly connected to a second piston rod formed by the through rod of said motor.

4,114,376
SERVO-ASSISTED HYDRAULIC BRAKING SYSTEM

Maurizio Cattaneo, Turin, and Antonino Bertone, Sant'Antonino (Vercelli), both of Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Sep. 24, 1976, Ser. No. 726,322
Claims priority, application Italy, Oct. 10, 1975, 69529 A/75
Int. Cl.[2] B60T 13/12
U.S. Cl. 60—548 5 Claims



1. A servo-assisted hydraulic braking system having:

a master cylinder closed at one end by an end wall,

first and second master cylinder plungers within said master cylinder, said master cylinder plungers defining between them a first master cylinder chamber, one of said master cylinder plungers defining a second master cylinder chamber between itself and said end wall of said master cylinder,

a driving piston slidable along said master cylinder and displaceable by the brake pedal of said braking system, such displacement also causing displacement of said first and second master cylinder plungers to control the pressure in said first and second master cylinder chambers,

means defining a driving piston chamber within said master

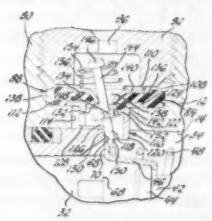
cylinder, said driving piston forming at least one wall of said driving piston chamber,
a distributor device,
a pressure generator,
means fluidly connecting said distributor device to said pressure generator,
means fluidly connected said distributor device to said driving piston chamber,
means fluidly connecting said first and second master cylinder chambers to said distributor device whereby to control said distributor device to feed pressure from said pressure generator to said driving piston chamber to reinforce the force applied to said driving piston by said brake pedal,
said distributor device comprising:
a distributor body,
means defining a cylindrical bore in said distributor body,
first and second end walls defining opposite ends of said cylindrical bore,
at least one control plunger sliding in said cylindrical bore said control plunger defining a control chamber between itself and said first end wall of said cylindrical bore of said distributor body,
said means for fluidly connecting said first and second master cylinder chambers to said distributor device include means fluidly connecting said control chamber of said distributor to one of said first and second master cylinder chambers,
a distribution plunger sliding in said cylindrical bore in said distributor body between first and second end positions, said distribution plunger defining a distribution chamber between itself and said second end wall of said cylindrical bore of said distributor body,
means defining a transverse passage in said distribution plunger, said transverse passage permitting communication between said pressure generating device and said distribution chamber of said distributor when said distribution plunger is in said second position thereof and preventing such communication when said distribution plunger is in said first position thereof, displacement of said distribution plunger between said first and second positions being controlled by the pressure in said control chamber of said distributor.

4,114,377

MASTER CYLINDER ASSEMBLY

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1976, Ser. No. 741,158
Int. Cl.[2] B60T *11/20*
U.S. Cl. 60—589 **2 Claims**



1. A master cylinder assembly comprising:
a housing having an axially extending bore therein, said bore having an axis;
piston means reciprocably movable in said housing bore in an axial direction along said bore axis and defining therewith hydraulic fluid pressurizing chamber means;
reservoir means for hydraulic fluid;
compensating passage means in said housing for selectively communicating hydraulic fluid between said reservoir means and said pressurizing chamber means and having a side wall and annular shoulder means formed therein;
compensating means including flanged valve seat means and tilt valve means continually urged toward seating engagement with said valve seat means, said compensating means being mounted in said passage means with a portion of said flanged valve seat means engaging and extending through said annular shoulder means, and said tilt valve means extending through said annular shoulder means and into said bore, said flanged valve seat means having an annular rubber-like valve seat formed with the inner periphery thereof providing the valve seat engageable by said tilt valve means, said valve seat being formed with resilient flutes on the outer periphery thereof, said resilient flutes having radially outward portions engaging said compensating passage means side wall and tending to centrally position said compensating means radially in said passage means, said tilt valve means being adapted to be operatively engageable by said piston means to open said compensating passage means with said piston means in the retracted non-pressurizing position and operatively disengageable by said piston means to close said compensating passage means upon predetermined movement of said piston means in a fluid pressurizing direction in said bore after completion of assembly of the master cylinder assembly;
said compensating passage means having a portion intermediate said annular shoulder means and said housing bore being of greater dimension at least in the housing bore axial directions than the similar dimension of the portion of said compensating means extending through said annular shoulder means, the difference in said dimensions permitting limited adjustment movement of said compensating means in directions parallel to the axis of said housing bore during assembly of the master cylinder assembly by radial compression of at least some of said resilient flutes;
and holding means during master cylinder assembly initially retaining said compensating means while permitting the aforesaid adjustment movement with said compensating means being set in axial bore position relation by the movement of said piston means from a pressurizing position to the retracted non-pressurizing position engaging said compensating means, said holding means being adapted upon completion of assembly to then further act to secure said compensating means against further movement in housing bore axial directions relative to said housing.

4,114,378

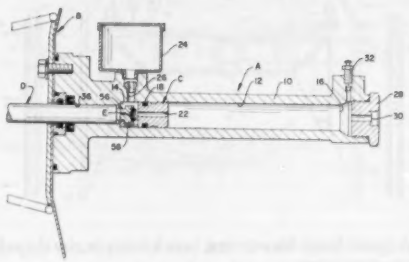
ROD AND PISTON CONNECTION FOR HYDRAULIC DEVICES

Dennis M. Stanuszek, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 20, 1976, Ser. No. 734,035
Int. Cl.[2] F15B *7/08*
U.S. Cl. 60—589 **1 Claim**

1. In a hydraulic device including a cylinder reciprocatingly receiving a piston separating said cylinder into first and second chambers, an axially extending passage through said piston for establishing communication between said chambers, a hydraulic fluid supply port communicating with said first chamber between one end of said cylinder and said piston, a push rod extending through said one end of said cylinder and being connected with said piston by lost motion connecting means for providing limited axial movement of said rod relative to said piston, said connecting means having no moving parts or fasteners separate from said rod and piston and including cooperating separable coupling parts formed integrally on said rod and piston for connecting and disconnecting said rod and piston by relative lateral movement therebetween, said coupling parts being formed integrally on said rod and piston in

the sense of being unitary and whole therewith as opposed to being made separately therefrom and then secured thereto, said coupling part on said rod comprising an enlargement defined on one end portion thereof between a terminal rod end facing said piston and a circumferential groove spaced from said rod end, said coupling part on said piston including a laterally open arcuate first pocket for closely receiving said enlargement and a laterally open arcuate second pocket axially aligned with said first pocket for closely receiving said groove, said pockets being separated by a radially extending shoulder, said first pocket having an axial length slightly greater than said enlargement and said second pocket having a length less than said groove so that said enlargement moves axially relative to said first pocket between said shoulder and one end of said piston,



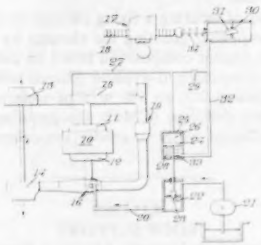
said rod end facing said piston having a bore therein with an entrance opening of smaller diameter than the diameter of said bore inwardly of said rod end, an elastomeric valve seal received in said bore and having a seal projection extending through said entrance opening outwardly of said rod end, said cylinder having a cylinder bore communicating with one end thereof, said rod being closely guided in said cylinder bore so that said separable coupling parts cannot be connected or disconnected while said piston is in said cylinder, said cylinder having a predetermined length and a removable plug at the opposite end thereof from said cylinder bore, and said rod having a length greater than said predetermined length for location of said separable coupling parts on said piston and rod outside of said cylinder beyond said opposite end thereof to connect or disconnect said coupling.

4,114,379

POWER UNIT

Jean Melchior, and Thierry Andre', both of Paris, France, assignors to Etat Francais, Paris, France

Filed Sep. 8, 1975, Ser. No. 611,010
Claims priority, application France, Sep. 10, 1974, 74 30519
Int. Cl.[2] F02B *33/44*
U.S. Cl. 60—606 **20 Claims**



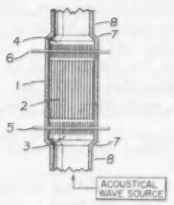
1. A supercharging system for a power unit of the type comprising an internal combustion engine having combustion chamber means of the expansible chamber type, a turbine-compressor unit for supercharging the engine and having at least one compressor and at least one turbine receiving the exhaust gases from the engine and driving the compressor, a bypass pipe through which all the air from the compressor which is not absorbed by the engine flows toward the turbine, an auxiliary combustion chamber disposed upstream of the turbine and receiving the air flowing in the bypass pipe and a fuel control system for supplying fuel to the auxiliary combustion chamber, said system comprising engine throttle means for varying the fuel supplied to said engine so as to vary the quantity of fuel injected into the combustion chamber means of said engine to thereby vary the torque developed by said engine as desired within the operating limits of said engine, and regulating means for operating said fuel control system to supply just enough fuel to the auxiliary combustion chamber such that the energy derived by the turbine from the auxiliary combustion chamber plus the energy derived by the turbine from the engine exhaust gases operates said turbine-compressor unit at an output flow rate just sufficient to prevent the ratio of fuel-to-air delivered to said engine combustion chamber means from exceeding a predetermined acceptable value, said engine throttle means comprising a fuel injection system of the positive metering type having a movable mechanical control element operable through a range of positions to vary the quantity of fuel injected per cycle into the engine combustion chamber means, and wherein said regulating means includes means sensing the engine supercharging pressure produced by said compressor and operable to correlate the value of the engine supercharging pressure thus derived with the position of said mechanical control element such that the supercharging pressure is maintained at a set value sufficient to insure that said fuel-to-air ratio does not exceed said predetermined acceptable value.

4,114,380

TRAVELING WAVE HEAT ENGINE

Peter Hutson Ceperley, 4803 Clemons Ct., Annandale, Va. 22003

Filed Mar. 3, 1977, Ser. No. 774,063
Int. Cl.[2] F03G *7/00*
U.S. Cl. 60—721 **7 Claims**



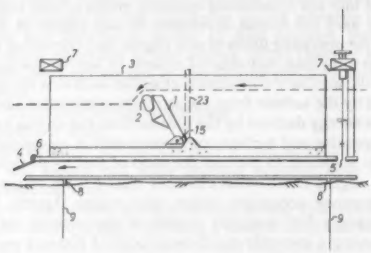
1. A heat engine comprising:
a. a compressible fluid capable of supporting propagation of an acoustical traveling wave,
b. a means for adding thermal energy to the fluid in one region of space (region A),
c. a means for extracting thermal energy from the fluid in another region of space (region B),
d. at least one stationary object in and/or between the two regions, in approximate thermal equilibrium with the fluid there, for the purpose of causing the temperature gradient which can exist in the fluid there to remain essentially stationary in the presence of wave induced fluid motion through the gradient, and
e. a means for causing an acoustical traveling wave to propagate on a path through the fluid from region B, through the region of stationary temperature gradient, into region A, in such a manner that the wave moves fluid back and forth through the stationary temperature gradient and so causes the fluid there to be heated and/or cooled in conjunction with the compression and expansion of the wave, for the purpose of transforming energy between the thermal form of the temperature gradient and the acoustical form of the traveling wave.

4,114,381

POSITIVE FLOW ESTUARY STRUCTURE

Roy W. Lundh, Glendora, Calif., assignor to Poseidon Marketing and Development Co., Arcadia, Calif.

Filed Mar. 18, 1977, Ser. No. 779,174
Int. Cl.[2] E02B *7/20, 7/44*
U.S. Cl. 405—94 3 Claims



1. A water stream barrier structure comprising a pair of horizontally spaced sidewalls, a floor structure interconnecting the side walls, horizontally aligned water gate panel means pivotally mounted at its lower ends between the side walls and the upper side of the floor structure, stop means on the upstream side of the side walls for holding the water gate means in an upright closed position, whereby the gate panel means is in a closed position when the water level on the downstream side is above the water level on the upstream side and the gate panel means will open when the upstream water level is above the downstream water level.

4,114,382

PROCESS FOR THE CONSOLIDATION OF GEOLOGICAL FORMATIONS AND LOOSENED ROCK AND EARTH MASSES

Rolf Kubens, Odenthal-Hahnenberg, and Frank Meyer, Essen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 598,108, Jul. 22, 1975, abandoned. This application May 6, 1977, Ser. No. 794,593
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1974, 2436029
Int. Cl.[2] E02D *3/12;* C08G *18/65;* E21D *11/00*
U.S. Cl. 405—264 17 Claims

1. A process for consolidating geological formations comprising applying an at least two-component reactive polyisocyanate/polyol mixture to the material to be consolidated wherein said reactive polyisocyanate/polyol mixture comprises:

(a) a polyisocyanate, and

(b) a polyol mixture comprising

(i) about 5–50% by weight of a polyether polyol having an OH number under 100 produced by the reaction between a compound having more than one reactive hydrogen atom per molecule and a molar excess of 1,2-alkylene oxide, and

(ii) about 95–50% by weight of a polyol selected from the group consisting of a polyhydroxyalkane having 2 to 4 hydroxy groups with a molecular weight of about 62 to 200 and a polyether polyol having an OH number of about 200 to 1056 with a molecular weight of about 106 to 1,000,

and wherein said reactive polyisocyanate/polyol mixture undergoes an isocyanate polyaddition reaction in the material to be consolidated.

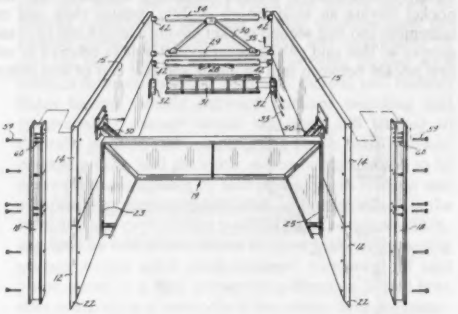
14. The process of claim 1 wherein the mixture is applied by pouring the components before they harden into a downwardly sloping drill hole in the material to be consolidated and then sealing the drill hole.

4,114,383

PORTAL FRAME FOR TRENCH BOX STACK

Allen J. Nieber, Northville, Mich., assignor to Efficiency Production, Inc., Okemos, Mich.

Division of Ser. No. 731,131, Oct. 12, 1976, Pat. No. 4,090,365.
This application Jan. 16, 1978, Ser. No. 869,677
Int. Cl.[2] E21D *5/12*
U.S. Cl. 405—282 2 Claims



1. A portal frame for securing trench boxes in plural stacked relation comprising:

a pair of vertical structural column elements in spaced-apart relation, each having a pair of spaced-apart flanges with plural pierced openings and a connecting web;

a plurality of thrust pads each having an opening therethrough and secured fixedly to said web and to said flanges at selected intervals over the length of said columns in register with selected of said pierced openings in said flanges;

a truss-like structural arch connected between the innermost of the flanges of said columns and having fastener openings therethrough in registry with said pierced openings in said flanges; and

fastener means through said openings and said thrust pads and sandwiching plural panels of said trench boxes between said flanges in stacked aligned relation.

4,114,384

METHOD OF SECURING FIXING ELEMENTS IN ROCK

Henry Kinny Kennedy-Skipton, West Kilbride, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 20, 1976, Ser. No. 734,355
Claims priority, application United Kingdom, Nov. 5, 1975, 45925/75
Int. Cl.[2] E21D *11/00*
U.S. Cl. 405—260 8 Claims

1. A method of securing a fixing element in a drillhole in a rock mass comprising grouting the element by pumping into the drillhole a plaster composition based on calcium sulphate hemihydrate comprising α-gypsum gauged with an aqueous solution containing 0.01 to 3% w/v of water-soluble salt of carboxy methyl cellulose (CMC), the grouting composition containing sufficient water to render the composition pumpable.

4,114,385

ROOF SUPPORT

Alfred Alphonse Marie Valantin, Clermont, France, assignor to Charbonnages de France, Paris, France

Filed Dec. 6, 1977, Ser. No. 858,064
Claims priority, application France, Dec. 7, 1976, 76 36769
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—298 21 Claims

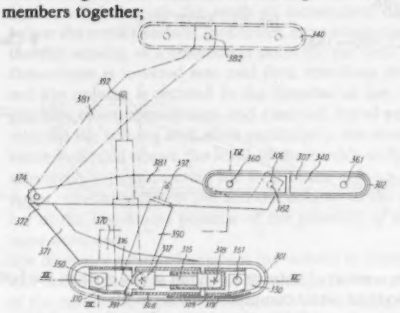
1. A roof support which is capable of being moved by its

own drive mechanism whilst under permanent load, comprising:

at least two lower carriages;

two cross members connecting the lower carriages together, which cross members are connected to the lower carriages by pivotal joints having at least two axes of rotation;

a lower longitudinal member connecting said two cross members together;



an arm articulated to one end of said lower longitudinal member, which arm swings above said longitudinal member;

a carriage support carried by the free end of said arm;

at least one upper carriage carried by said support and oriented parallel to the lower carriages; and

jack means connected between said lower longitudinal member and said arm and operable to vary the separation between said carriage support and the lower carriages.

4,114,386

METHOD AND DEVICE FOR REMOVING RESILIENT GALLERY LINING FRAMES IN MINING AND TUNNELLING WHICH CONSIST OF A NUMBER OF SECTION SEGMENTS INSERTED ONE INTO ANOTHER IN A DISSIMILAR MANNER

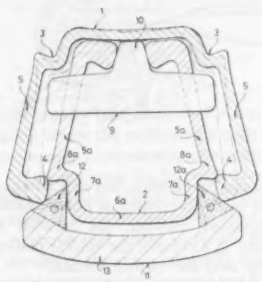
Gerd Radner, Herne, and Christoph Zillessen, Recklinghausen, both of Germany, assignors to Ruhrkohle, A.G., Germany

Filed May 9, 1977, Ser. No. 795,347

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623909

Int. Cl.[2] E21D *11/22*

U.S. Cl. 405—150 **12 Claims**



1. A method for removing gallery lining frames formed of at least inner and outer deformable frame segments, each of said segments having a generally C-shaped cross section with a pair of arms joined by an intermediate connection member having an exterior flange, the ends of said segments being slid into one another with the C-sections of the segments opening in opposite directions to form a closed tube in a region of overlap, said method comprising the steps of:

releasing any forces applied to said segments parallel to the plane of the cross sections and urging the overlapping segment ends into contact;

forcing the arms of the outer segment apart at the end thereof an amount sufficient to permit release of the end of the inner member; and

moving the end of the inner member substantially normal to the opening between the arms of the outer member to release the overlapping segments from one another and recover the lining frame.

4,114,387

MINE ROOF SUPPORT

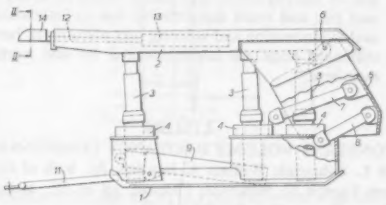
Dennis Franklin Rutherford, Bishops Cleeve, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Jul. 5, 1977, Ser. No. 812,696

Claims priority, application United Kingdom, Jul. 7, 1976, 28175/76

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—293 **10 Claims**



1. A mine roof support having a roof-engageable means which includes a roof-engageable pad, at least one lever by which said pad is connected to the remainder of the roof-engageable means, and ram means which is disposed within the profile in plan of said pad and which is operably connected to the pad, said pad being so shaped in plan that its maximum dimension in the fore-and-aft direction of the support (as herein defined) is substantially less than the maximum dimension thereof at right-angles to that direction, and said ram means being operative in a direction at right-angles to, or substantially at right-angles to, said fore-and-aft direction of the support to move said lever to adjust the height of the pad with respect to the remainder of the roof-engageable means.

4,114,388

PILE PROTECTION DEVICE

Erik K. Straub, Carroll Rd., Monkton, Md. 21111

Filed Apr. 20, 1977, Ser. No. 789,431

Int. Cl.[2] E02D *5/60*

U.S. Cl. 405—216 **7 Claims**

1. A pile protection device for preventing an ice formation from collecting on and subsequently extracting a pile as a result of variation of tide level, which comprises:

guard means concentrically mounted to and axially extending along said pile, said guard means being tapered such that the diameter of said guard means decreases in an upward direction to thereby allow said ice formation to be vertically displaced relative to said guard means during said tide level variation whereby said ice formation is prevented from extracting said pile during said tide level variation;

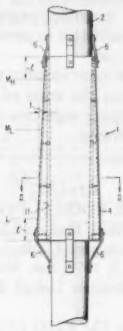
means for firmly securing said guard means to said pile; and

stiffening means connected to said guard means at a plurality of points along the length of said guard means and located between and interconnecting said guard means and said pile wherein said stiffening means comprises;

a plurality of sidewall stiffening rings disposed adjacent said guard means;

vertical fin members connected to said side wall stiffening rings; and

a plurality of horizontal stiffening rings connected to said sidewall stiffening rings operatively associated with said



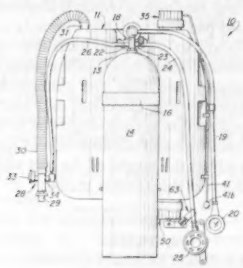
pile to thereby allow said guard means to firmly engage said pile and resist deformation due to interaction with said ice formation and wherein said plurality of horizontal stiffening rings are interconnected by said vertical fin members.

4,114,389

CONSTANT VOLUME BUOYANCY COMPENSATOR

Jack L. Bohmrich; William A. Bowden, Jr., both of Glenview, and Vernon G. Pedersen, Chicago, all of Ill., assignors to Dacor Corporation, Northfield, Ill.

Filed Jul. 1, 1977, Ser. No. 812,139
Int. Cl.[2] B63C *11/02*
U.S. Cl. 405—186 **10 Claims**



1. An underwater buoyancy compensator for use by divers, comprising

a buoyancy tank adapted to be carried by a diver and having therein a sealable chamber of constant volume,

gas inlet valve means connected between said chamber and a source of gas under pressure,

first pressure relief valve means mounted at the top of said tank for connecting the top of said chamber to the ambient when the pressure across said first valve means exceeds a predetermined amount,

second pressure relief valve means mounted at the bottom of said tank for connecting the bottom of said chamber to the ambient when the pressure across said second valve means exceeds a predetermined amount,

first manually operable means connected to said first pressure relief valve means for enabling the diver to manually open said first valve means, and

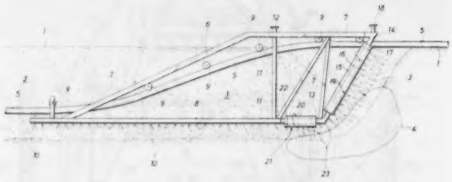
second manually operable means connected to said second pressure relief valve means for enabling the diver to manually open said second valve means.

4,114,390

BURYING A CONDUIT IN THE BOTTOM OF A BODY OF WATER

Johannes Van Steveninck, Rijswijk, and Jan Lincklaen Arriens, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1977, Ser. No. 806,128
Claims priority, application United Kingdom, Jun. 28, 1976, 28803/76
Int. Cl.[2] E02F *5/02*
U.S. Cl. 405—163 **9 Claims**



1. A method of burying a conduit in the earth at the bottom of a body of water comprising the steps of:

a. displacing a fluidization device along the conduit,

b. via fluidization nozzles of the fluidization device injecting fluid at low velocity and at low pressure into non-cohesive bottom material adjacent to the conduit so that the non-cohesive bottom material is fluidized,

c. allowing the conduit, together with the fluidization device, to sink into the fluidized bottom material,

d. eroding cohesive bottom material by injecting fluid at high velocity and at high pressure into the cohesive bottom material via fluidization nozzles on the front of the fluidization device,

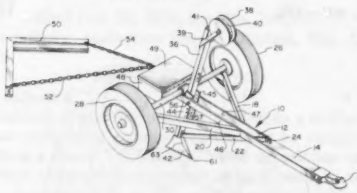
e. moving the fluidization nozzles on the front of the fluidization device in a direction other than the direction of displacement of the fluidization device, so that a wide opening is formed in the cohesive bottom material by the fluid jets issuing from the nozzles.

4,114,391

TAPE LAYING TRENCHING APPARATUS

Vance F. Kahley, Sr., 3231 S. Eldredge, Salt Lake City, Utah 84115

Filed Mar. 24, 1977, Ser. No. 780,898
Int. Cl.[2] E02F *5/12*
U.S. Cl. 405—176 **6 Claims**



1. An apparatus for continuously depositing a tape below the surface of the earth comprising in combination:

a wheel-mounted drawbar, the drawbar accommodating attachment to a vehicle, the vehicle pulling the apparatus forwardly over the earthen surface;

a vertically oriented column demountably attachable to the drawbar in a plurality of vertically adjustable positions;

a trenching blade on the lower end of the column

a plurality of attachment sites on the column for releasably attaching the column to the drawbar at a plurality of vertically adjustable positions relative to the drawbar, the lowermost position supporting the trenching blade above the earthen surface;

the first lower, strut attachment site adjacent the lower end of the column;

a second, upper, strut attachment site adjacent the upper end of the column;

a strut selectively interconnectable between the drawbar and the column, the strut being selectively interconnected to said lower, strut attachment site thereby supporting the column in a first, trenching position with the trenching blade pulled through the earth an incremental distance below the earth's surface, said lower, strut attachment site thereby serving as a connection point for the strut when the column is lowered into said first, trenching position and the column is secured to the drawbar at one of the plurality of attachment sites, and a second, travel position wherein the column and, more particularly, the trenching blade is carried above the level of the earth's surface by selectively interconnecting the strut to the column at the upper, strut attachment site and the column to the drawbar at the lowermost position of the plurality of attachment sites; and

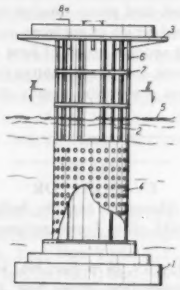
a tape dispenser mounted adjacent the column to accommodate feeding the tape downwardly along at least a portion of the column to a position adjacent the trenching blade.

4,114,392

PLATFORM STRUCTURE FOR MARITIME INSTALLATIONS

Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris," Paris, France

Filed Jun. 24, 1977, Ser. No. 809,897
Claims priority, application France, Jun. 24, 1976, 76 19227
Int. Cl.² E02B *17/00*
U.S. Cl. 405—207 **4 Claims**



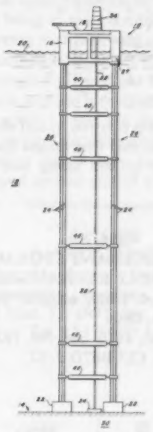
1. An off-shore gravity type platform for supporting a processing installation above the surface of a body of water and for housing processing components, comprising a coffered base structure for resting upon the bed of the body of water; a pressure-resisting watertight hollow shaft integrally connected to the base structure to be supported by the same and extending therefrom up to above said water surface a protective wall around a foot portion of the shaft, integrally connected to the base structure to be supported by the same and having a height substantially less than the depth of said body of water; a plurality of hollow pillars supported by the protective wall and extending therefrom up to above said water surface; a bridge supported on the upper ends of said hollow shafts and said hollow pillars; and means for filling the pillars with concrete; said base structure and said hollow shaft being so sized that the platform in an unballasted condition has a positive buoyancy.

4,114,393

LATERAL SUPPORT MEMBERS FOR A TENSION LEG PLATFORM

Donald D. Engle, Jr., Brea, and Michael E. Utt, Placentia, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Jun. 20, 1977, Ser. No. 807,905
Int. Cl.² E02B *17/00*
U.S. Cl. 114—264 **13 Claims**



1. A platform for operations in a body of water at an offshore location, which comprises:

a working deck;

a buoyant structure for supporting said working deck above the body of water;

a plurality of anchors on the floor of the body of water;

a plurality of tension legs, each of said legs being comprised of one or more cables and being attached at one end to one of said anchors and at the other end to said buoyant structure;

tensioning means for applying tension to said cables and thereby drawing down said buoyant structure to a working position in the body of water; and

one or more rigid, fixed-dimensioned support members interconnecting said legs and each of said cables, each of said support members being vertically positioned along the length of said cables between the buoyant structure and the anchors to reduce the unsupported length thereof such that the fundamental frequency of the unsupported sections of said cables is higher than the highest flutter frequencies likely to be encountered.

4,114,394

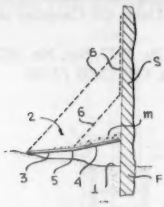
APPARATUS FOR PREVENTING EROSION OF THE SEABED IN FRONT OF HYDRAULIC STRUCTURES

Ole Fjord Larsen, 62 Fasanvaenget P. O. Box 604, DK 6700 Esbjerg, Denmark

Continuation of Ser. No. 604,836, Aug. 14, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,606
Int. Cl.² E02B *3/04*
U.S. Cl. 405—25 **20 Claims**

1. The combination of a marine structure having a foot disposed in the bed of a body of water and first means for reducing and preventing scours of the bed at the foot of the marine structure with the foot in place, second means mounting said first means for general vertical sliding movement along said foot, said first means having opposite first and second end portions, said first end portion being more remotely spaced from said foot than said second end portion in a first in-place operative position of said first means, said second

means including vertical channel guiding means carried by said foot to which is slidably guidably interconnected said second end portion for guided vertical movement of said second end



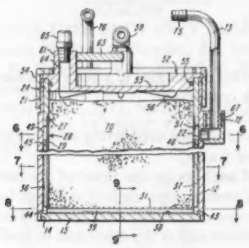
portion and said first means relative to and along said foot, and cable means connected to said first means for slidably moving said first means relative to and along said vertical guiding means.

4,114,395

INTEGRATED REFRIGERANT STORAGE CANISTER AND HEAT EXCHANGER

Carl E. Simmons, Oxford, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 23, 1976, Ser. No. 753,738
Int. Cl.[2] B67D *5/62*
U.S. Cl. 62—386 **10 Claims**



1. An integrated refrigerant storage canister and heat exchanger, especially a device which in use occupies a generally upright position including

a. an assembly comprising nested inner and outer containers, the former being adapted to contain a solid state refrigerant sublimated by a transfer of heat through defining wall portions of said inner container into the refrigerant,

b. said inner container having a closed bottom wall portion in supporting relation to a contained refrigerant material,

c. means for conducting released gas from said inner container,

d. means for conducting a circulating fluid absorbing heat at a relatively remote source to and from said assembly,

e. and means for conducting the circulating fluid through said assembly by way of a path requiring it to pass between said containers in heat transfer relation to said bottom wall portion of said inner container,

f. side and bottom wall portions of said inner and outer containers being in a spaced relation to one another,

g. separators positioning longitudinally within the space between side wall portions and defining vertical flow passes interconnected at their lower ends by a space between bottom wall portions defining a horizontal flow pass,

h. there being connections to and from upper ends of respective vertical flow passes for inflow and outflow of said fluid,

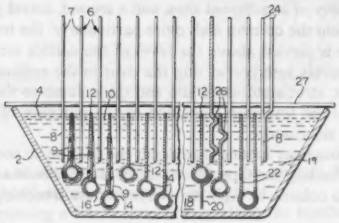
i. and said connections and said separators cooperating to require a path of flow for said fluid taking it downward in one of said vertical flow passes, transversely through said horizontal flow pass and upwardly in the other of said vertical flow passes.

4,114,396

REFRIGERATION EVAPORATOR COIL WITH NON-FROSTING FINS

Glenn E. Rickert, Community Bank Building, Huntington, Ind. 46750

Continuation-in-part of Ser. No. 716,789, Aug. 23, 1976. This application Jan. 31, 1977, Ser. No. 763,874
Int. Cl.[2] F25D *17/04, 11/00, 3/10;* **F28D** *13/00*
U.S. Cl. 62—406 **7 Claims**



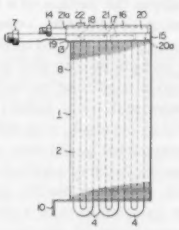
1. In a heat absorption system, the improvement for temperature stabilizing heat load absorbing surfaces comprising: heat absorption means, a first series of heat exchange surfaces in good heat transfer relationship with said heat absorption means, a second series of heat exchange surfaces in good heat transfer relationship with a heat load, heat storage means including phase change material, said first series of heat exchange surfaces and said second series of heat exchange surfaces disposed generally parallel to one another and interspersed in close proximity to provide a good connection for heat transfer therebetween through said phase change material, said first series of heat exchange surfaces, said second series of heat exchange surfaces, and said phase change material adapted to permit said phase change material to transfer heat from said second series of surfaces to said first series of surfaces so that said second series of heat exchange surfaces can be maintained near the phase change temperature of said material by said heat absorption means during various heat load conditions.

4,114,397

EVAPORATOR

Reijiro Takahashi; Masanori Musoh, both of Katsuta, and Tosikazu Ito, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 19, 1976, Ser. No. 743,492
Claims priority, application Japan, Nov. 21, 1975, 50-139297
Int. Cl.[2] F25B *39/02*
U.S. Cl. 62—516 **12 Claims**



1. An evaporator comprising:

a tube plate,

a first cover plate secured to said tube plate to form connecting passage means and refrigerant-collecting passage means between said tube plate and said first cover plate,

a second cover plate secured to said first cover plate to form refrigerant-introducing passage means between said first cover plate and said second cover plate,

constriction means communicated with said refrigerant-introducing passage means,

expansion valve means disposed between said first cover plate and said second cover plate and directly communicated with said refrigerant-collecting passage means and said refrigerant-introducing passage means,

and control means for controlling said expansion valve means.

4,114,398

PROCESS FOR PRODUCING ARTICLES OF JEWELRY, TRINKETRY AND THE LIKE, MADE OF METALS OF DIFFERENT COLORS

Orlando Paladino Orlandini, Arezzo, Italy, assignor to Gori & Zucchi S.p.A., Italy

Filed Feb. 10, 1977, Ser. No. 767,617
Claims priority, application Italy, May 31, 1976, 49729 A/76
Int. Cl.[2] A44C *5/00*; B23P *13/00*
U.S. Cl. 63—3 **25 Claims**

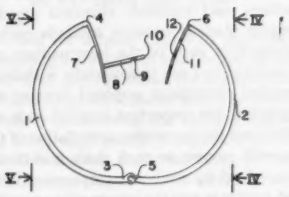
1. A method of making jewelry from a plurality of elongated metallic elements having progressively smaller cross-sections, at least each of said elements other than the one having the smallest cross-section being hollow and having an interior opening sufficiently large to accommodate the element having the next-smaller cross-section, which comprises the steps of: inserting said elements one inside the other to form a composite elongated element; drawing said composite elongated element; cutting said composite elongated element into sections; shaping said sections into jewelry configuration; and removing material from portions of said composite elongated element to expose at least one interior elongated element.

4,114,399

EARRING FOR PIERCED EAR

Walter J. Zur, Blairmore, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 20, 1977, Ser. No. 789,143
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—12 **1 Claim**



1. An earring for a pierced ear, said earring comprising

first and second substantially semiannular parts having mutually spaced first and second ends, the first end of each being pivotally affixed to the first end of the other whereby when closed said parts form a substantially annular member;

a first arm extending inwardly from the second end of the first part at approximately 60° therewith, said first arm having a pin extending therefrom substantially perpendicularly thereto toward the second part and a notch formed in the pin in the area of the free end thereof; and

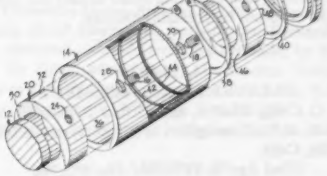
a second arm extending inwardly from the second end of the second part at approximately 60° therewith, the first and second arms being in spaced substantially parallel relation when the earring is closed, said second arm having a bore therein for accommodating the pin whereby when the pin is passed through a pierced ear lobe and into the bore of the second arm said pin is releasably locked to said second arm via the notch of said pin thereby releasably locking the first and second parts together to form a substantially annular member which may be opened by downward pressure on said second end of said second part.

4,114,400

SAFETY SLEEVE

H. Oscar Schlenker, Aberdeen, S. Dak., assignor to Safeguard Automotive Corporation, Aberdeen, S. Dak.

Filed Mar. 11, 1977, Ser. No. 776,729
Int. Cl.[2] F16C *1/06*
U.S. Cl. 64—3 **9 Claims**



1. A safety sleeve for exposed rotating shafts comprising:

(a) an enclosure member that substantially encloses said rotating shaft, said enclosure member having inner and outer surfaces;

(b) an annular collar having an outer and an inner surface, said outer surface in direct contact and frictional engagement with said inner surface of said enclosure member, said inner surface of said collar in direct contact with the outer surface of an exposed rotating shaft, said annular collar having a threaded aperture therein;

(c) screw means received within said threaded aperture for securing said annular collar to said shaft for rotation therewith; and

(d) whereby said enclosure member is normally driven by said annular collar to rotate in connection with said shaft and upon contact with said outer surface of said enclosure member said enclosure member is released from driving engagement with said annular collar and said enclosure member remains stationary while said annular collar rotates with said rotating shaft and in sliding contact with said enclosure member.

4,114,401

UNIVERSAL JOINT EMBODYING OSCILLATING DRIVE PIN

William E. Van Hoose, 4117 Brompton Ave., Bell, Calif. 90201

Filed Jan. 24, 1977, Ser. No. 761,532
Int. Cl.[2] F16D *3/10*
U.S. Cl. 64—7 **7 Claims**

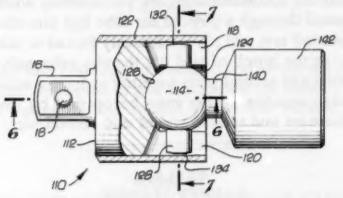
1. A heavy duty universal joint usable for tools in which the

two ends of the tool may be misaligned, said universal joint comprising:

a socket having a ball receiving bore, a socket ball engaged in the socket bore, a pair of diametrically opposing slots in the socket wall outwardly of the bore.

a pin extending through a bore in the ball and having its ends therebeyond extending into said respective slots and being adapted to oscillate therein,

said ball forming a large substantially solid mass around the pin so as to provide great strength in the pin and ball engagement.



means on said pin adjacent and generally within the external surface of said ball to positively retain said pin within the socket in the axial direction of the pin, and

means associated with said ball and socket to retain the ball in the socket.

said pin having two parallel flat sides adjacent each end,

said slots having flat sides on which said flat sides on said pin slide as they oscillate.

said flat sides of said pin being fitted in said flat sides of said slots so as to not be rotatable therein.

4,114,402

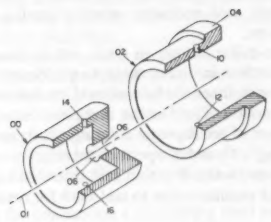
FLEXURE HINGE ASSEMBLY

Robert J. C. Craig, Malibu, and Clifton T. Council, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 5, 1976, Ser. No. 673,746

Int. Cl. F16d *3/52*

U.S. Cl. 64—15 B **16 Claims**



1. A flexure hinge assembly comprising:

a pair of inner and outer concentric tubular members secured to one another, each of said tubular members having a plurality of pairs of adjacent apertures extending through the wall thereof and each of said pairs of apertures forming a flexure blade defining a first plane of flexure including therein a radial flexure axis and a longitudinal axis perpendicular to said flexure axis the plane of flexure of each blade in said inner tubular member being oriented substantially perpendicular to the plane of flexure of a flexure blade in said outer tubular member, a pair of mutually adjacent flexure blades with substantially perpendicularly oriented flexure planes defining a common flexure axis to form a flexure hinge;

said inner tubular member having a driven element portion, a gimbal element portion, and a driven element portion, connected to a pair of inner flexure blades, said outer tubular member having a driving element portion, a gimbal element portion and a driven element portion, each said inner gimbal element portion connected to said driving element portion and to said inner driven element portion by a pair of juxtaposed flexure blades, respectively, each said outer gimbal element portion connected to said outer driving element portion and to said outer driven element portion by a pair of juxtaposed flexure blades, respectively; and

said inner driving element portion and said inner driven element portion being axially displaced in the same direction from their respective flexure axes, said outer driving element portion and said outer driven element portion being axially displaced in the same direction from their respective flexure axes.

4,114,403

COUPLINGS

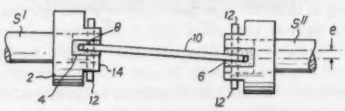
John Constantine Grey, Osterley, England, assignor to Thorpenco (Sales & Service Ltd.), England

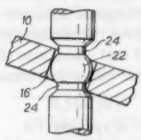
Filed Jan. 6, 1977, Ser. No. 757,243

Claims priority, application United Kingdom, Jan. 7, 1976, 442/76; Mar. 25, 1976, 11940/76

Int. Cl.[2] F16D *3/14, 3/52*

U.S. Cl. 64—15 B **8 Claims**



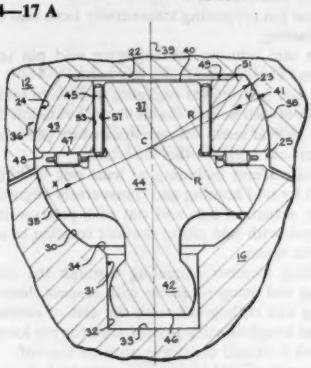


1. A flexible rotary coupling for connecting together a pair of shafts in a state of misalignment, comprising respective end members for attachment rigidly to the respective shafts and an intermediate substantially rigid torque-transmitting member extending between the end members, resiliently yieldable elements being disposed between the intermediate member and the end members, said yieldable elements providing transversely extending seatings opening towards each other and into which respective ends of the intermediate member are transversely inserted and are transversely withdrawable, said yieldable elements comprising opposed bearing surfaces for yieldably supporting the respective inserted ends of the intermediate member and for permitting articulation of the intermediate member with respect to each shaft, said elements transmitting a torque load by resilient compression between their respective end members and the intermediate member, relative pitching movements between the intermediate member and each end member about an axis extending in said transverse direction also being accommodated by resilient compression of said elements between their respective end members and the intermediate member.

4,114,404
UNIVERSAL JOINT

Orville E. Phelps, Sylvania, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed May 2, 1977, Ser. No. 793,206
Int. Cl.[2] F16D *3/30, 3/28*
U.S. Cl. 64—17 A **11 Claims**



1. In a universal joint comprising first and second rotatable members, each of said members having an axis of rotation, said rotatable members adapted to be disposed in a cooperative relationship in which said axes of rotation intersect at an angle,

said first rotatable member having a torque element receiving means and said second rotatable member having a pilot receiving means disposed in a cooperative paired relationship with said torque element receiving means,

a torque transmitting mechanism having a generally longitudinal axis, said mechanism comprising a torque element disposed at one end of said axis, said torque element disposed at least partially within said torque element receiving means and adapted for movement within said torque element receiving means, and a pilot disposed at another end of said axis, said pilot disposed at least partially within said pilot receiving means and adapted for pivotal engagement with said pilot receiving means,

the improvement wherein said torque transmitting mechanism comprises a bearing assembly having a bearing race disposed at least partially within said torque element receiving means and drivingly engaged with said torque element receiving means, said bearing race at least partially containing said torque element.

4,114,405
CONTROL UNIT FOR A HAND KNITTER

Manfred Bartels, Cologne, Fed. Rep. of Germany, assignor to Empisal Knitmaster Luxembourg S.A., Luxembourg, Luxembourg

Filed Oct. 6, 1977, Ser. No. 839,931
Int. Cl.[2] D04B *7/00, 15/66*
U.S. Cl. 66—75.2 **23 Claims**

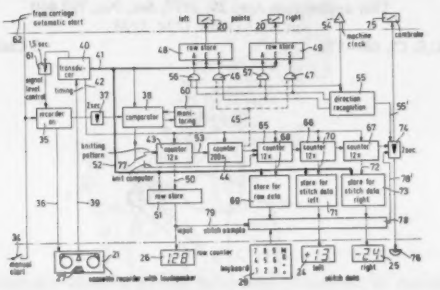
1. A control unit for a hand knitter of the type having a needle bed containing a plurality of needles and on which there is mounted a movable carriage means for adjusting the position of needles individually in accordance with a proposed knitting pattern and thereby performing the knitting operation, said carriage means being displaceable transversely to the needles, characterized in that shaping data concerning the outline contour of the knitting is presented to the user, said control unit comprising:

a data source (**21**) for the shaping data of the knitting, said source containing knitting row numbers and stitch data concerning how many stitches are to be added to or reduced from the rows of the knitting identified by said knitting row numbers,

a store (**71,73**) for the stitch data,

a store (**51**) for row data,

said data source (**21**) supplying the stitch data to said store (**71,73**) for the stitch data and the number for the corresponding row to said store (**69**) for row data,



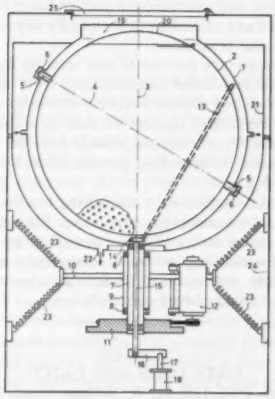
an indicating device (**24,25**), and

a row store means (**51**), containing the number of a row to be knitted, for causing said stitch data to be supplied to said indicating device (**24, 25**) if the contents correspond to a number contained in the store for row data.

4,114,406
WASHING MACHINE

Alexandre Horowitz; Georg Rudolph Wolter Kymmell; Johannes Krijne, all of Eindhoven, Netherlands; Bernard Joseph Beusink, deceased, late of Oerle, Netherlands, by Friedrich Jacobus De Haan, administrator, Dommelen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 786,046
Claims priority, application Netherlands, Apr. 12, 1976, 7603833
Int. Cl.[2] D06F *23/06*
U.S. Cl. 68—24 **5 Claims**



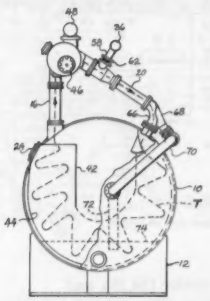
1. A laundry washing machine which comprises a substantially spherical washing liquid container, means to mount said container on a first shaft for rotation about a first diametrical axis, first means to rotate said container about said first axis, a substantially spherical laundry holder having a wall permeable to washing liquid, means to mount said holder within said container for rotation about a second diametrical axis, and second means to rotate said holder about said second axis, the two axes of rotation intersecting each other.

4,114,407

SOFT FLOW JET DYEING MACHINE

James Keith Turner, Lincolnton, and William Cleere Sturkey, Charlotte, both of N.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Continuation of Ser. No. 690,574, May 27, 1976, abandoned.
This application Apr. 29, 1977, Ser. No. 792,460
Int. Cl.[2] D06B *3/24, 3/28*
U.S. Cl. 68—178 5 Claims



1. In apparatus for wet processing textile material in endless strand form in which a vessel is provided for containing the treating liquor employed for the wet processing and through which liquor the textile material is circulated to and from a plaited accumulation thereof within said vessel, the improvement which comprises:

(a) a rotatable lifter roll disposed above said vessel and driven for vertically elevating said textile material progressively from said plaited accumulation and said treating liquor;

(b) a downwardly extending treating liquor tube;

(c) a downwardly inclined textile material directing tube disposed adjacent said lifter roll for receiving textile material therefrom, said directing tube having a downwardly extending cylindrical end portion concentrically enclosed within an intermediate cylindrical portion of said treating liquor tube, said intermediate portion being free of internal restriction and extending downwardly beyond said directing tube end portion;

(d) a discharge tube portion of said treating liquor tube free of internal restriction and extending from said intermediate tube portion downwardly for discharge into said vessel, the remaining portion of said directing tube being surrounded by an enlarged plenum chamber communicating with said intermediate portion of said treating liquor tube; and

(e) means for continuously circulating treating liquor from said vessel to said plenum chamber for delivery to said treating liquor tube and return therethrough to said vessel while also effecting active treating liquor penetration of said textile material and facilitating the return of said material to said plaited accumulation.

4,114,408

GATE LOCK AND LATCH

Victor L. Gee, 1511-12th St. W., Billing, Mont. 59102

Filed Apr. 4, 1977, Ser. No. 784,170
Int. Cl.[2] E05C *5/02;* E05B *37/12*
U.S. Cl. 70—128 4 Claims

1. In a lock:

an elongated housing including end closures and a lateral wall;

a bolt extending through said end closures and carried thereby for rotation in first and second opposite senses about a longitudinal axis, and for linear displacement in first and second opposite directions aligned with said axis;

means carried by one end of said bolt outside said housing for manually causing the displacement and rotation of said bolt, and for engaging one of said end closures, and thus limiting the linear movement of said bolt in a first direction, to define an operative position for said bolt in which the other end of said bolt extends outwardly beyond the opposite end closure;

at least one pin projecting transversely from said bolt within said housing;

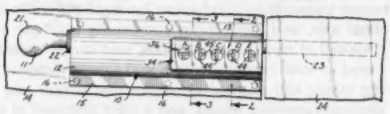
means in said housing for engaging said pin to limit the rotation of said bolt in said first sense;

means in said housing for engaging said pin in said operative position of said bolt to enable limited rotation of said bolt in said second sense and simultaneously prevent displacement of said bolt in either direction;

and a control unit including at least one locking member carried by said housing and transversely aligned with said pin for actuation into and out of a position in which it interferes with said pin to prevent rotation of said bolt in said first sense;

said locking member extending through the wall of said housing and being rotatable with respect thereto about a locking axis orthogonal with the axis of rotation of said bolt and longitudinally aligned with the pin location when said bolt is in said operative position thereof;

the outer end of said locking member including means for causing rotation thereof in said housing, and bearing indicia identifying the rotated relation of said member with respect to said housing, and the inner end of said locking member being configured to enable passage of said pin, in a first rotated relation of said member with respect to said housing, and to prevent passage of said pin in other rotated relations of said member with respect to said housing.



4. A lock control unit comprising a mounting plate having a plurality of aligned cylindrical bores formed therein with their axes parallel;

a plurality of locking members having outer cylindrical portions for rotation in said bores, inner portions, and intermediate annular grooves of smaller diameter than said outer and inner portions;

a holding member for securing said locking members to said mounting plate, including a slot to snugly receive said grooves of said members, so that when the holding member is secured against a face of said mounting plate with said outer ends of said members in said bores and said grooves in the slot of said holding means, the members are rotatable but not translatable with respect to said plate;

axial cylindrical bores in said inner ends of said outer portions of said locking members;

cross bores extending outwardly from said cylindrical bores at predetermined angular spacings therearound, and at the same axial location therealong;

said inner portions including bodies rotatable in said axial bores, ball detents in said bodies and aligned longitudinally with said cross bores, and enlarged heads extending beyond said bores;

release ramps formed in said heads of said inner portions in known positional relation to the directions of said ball detents;

secantal guide openings in said heads of said inner portions arranged to be coaxial when said inner portions are simultaneously in predetermined angular positions about the axes of said bores, so that a common member passing through said openings may hold all said inner portions against rotation about said axes;

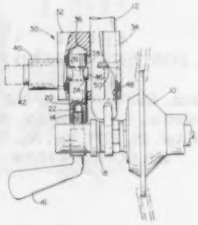
and means carried by the outer ends of said locking members for causing rotation thereof in said bores.

4,114,409

LOCK ASSEMBLY FOR BICYCLE WHEEL QUICK RELEASE MECHANISM

Joseph S. Scire, 526 Beacon St., Boston, Mass. 02215

Filed Apr. 27, 1977, Ser. No. 791,486
Int. Cl.[2] B62H *5/00*
U.S. Cl. 70—225 **5 Claims**



1. A lock assembly for a bicycle wheel quick release mechanism having a shaft extending therethrough transversely of the wheel axle, said shaft adapted, when turned in one direction, to release the wheel for mounting or removal on the fork of a bicycle and, when turned in the other direction to secure said wheel on a bicycle wheel fork, characterized in that the lock assembly comprises:

a shaft extension adapted at one end for connection to said shaft and having a shoulder spaced from and facing said one end; and

a housing adapted for connection to a bicycle wheel fork and adapted to receive said shoulder of said shaft extension, said housing comprising two parts, a first part having a bore for removeably receiving said shaft extension with said shaft extension connected to a shaft and having a lock pin mounted therein selectively moveable to engage and disengage said shoulder and having a lock connected to said lock pin adapted to lock said pin in a shoulder engaging position, and a second part adapted for connection to said first part, defining with said first part a through bore between said first and second parts for receiving said bicycle wheel fork therein.

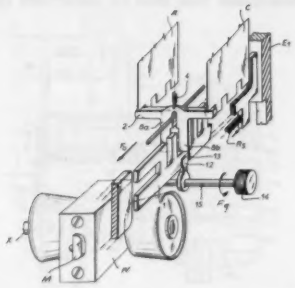
4,114,410

LOCKING DEVICE AND MEANS FOR ACTUATING THIS DEVICE

Pierre Jean Baptiste Astier, 76 Rue de Crimée, 75019 Paris, France

Filed Sep. 26, 1977, Ser. No. 836,546
Claims priority, application France, Oct. 20, 1976, 7631629
Int. Cl.[2] E05B *25/00*
U.S. Cl. 70—339 **12 Claims**

1. An improved device which can be adapted to an existing lock to allow the actuation thereof, the device being characterized by the fact that it consists of a movable plunger provided with slots which mesh with at least two rocking components meant to engage in the said slots when they are biased by insertion into this device of a notched reference component to prevent movement of said plunger, said rocking components being adapted to be disengaged from said slots and freeing said plunger by the insertion into this device of a second notched



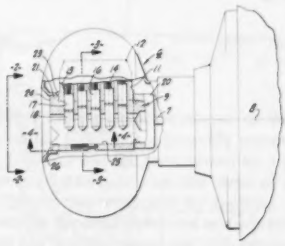
component identical to said reference component, to permit direct actuation of the mechanism of the lock.

4,114,411

AUGMENTED KEY AND CYLINDER LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Mar. 7, 1977, Ser. No. 774,784
Int. Cl.[2] E05B *9/04, 19/04*
U.S. Cl. 70—421 **2 Claims**



1. An augmented key and cylinder lock comprising a housing having a bore therein concentric with an axis, a plug in said bore and rotatable around said axis, a flange extending radially outwardly on one end of said plug and overlapping said housing, pin tumbler mechanism in said housing and in said plug, means defining a keyway in said plug extending along said axis and disposed in communication with said pin tumbler mechanism and with said bore, means defining a notch through said flange disposed radially outwardly of said keyway and in communication therewith, a detent on said housing and axially movable between a first position projecting into said notch alongside said keyway and a second position clear of said notch, means for moving said detent to said second position, said moving means comprising a key having a shank movable axially into said keyway and also having a bow and an augmented shoulder merging with said shank and said bow and axially movable into said notch as said shank is fully moved into said keyway.

4,114,412

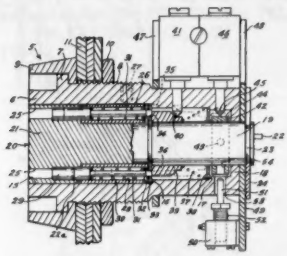
TUMBLER LOCK ALARM CONSTRUCTION

Willi Braatz, 8885 Appleknoll La., Cincinnati, Ohio 45236

Filed Feb. 24, 1977, Ser. No. 771,536
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—441 **5 Claims**

1. In a tumbler lock alarm construction the combination of a lock case, a barrel rotatable in the case, tumblers movable in

the case and the barrel, a lock tampering sensor responsive to the initial axial movement of any one of the tumblers, a time delay means energized by the sensor and set to provide a normal predetermined time limit for authorized operation of



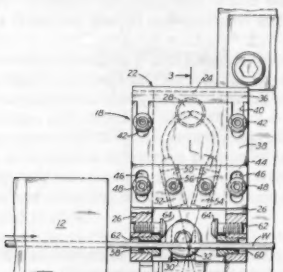
the lock, means responsive to the full rotation of the barrel adapted to deenergize the time delay means, and an alarm means triggered by the time delay means after the lapse of the set predetermined time limit of said time delay means.

4,114,413

BROKEN WIRE SWITCH APPARATUS

Paul W. Huddleston, Tallmadge, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Sep. 2, 1977, Ser. No. 830,290
Int. Cl.[2] B21C *1/12*
U.S. Cl. 72—5 **1 Claim**



1. In combination with a machine for producing a continuous flow of material having an energy reflective characteristic, such as wire produced by a wire drawing machine,

a switch for interrupting operation of the machine and hence the flow of wire wherein the wire flows in a generally predetermined path of travel for at least a portion of its travel through the machine,

an energy emitting means,

means for maintaining said energy emitting means so that its energy is directed to intercept said path of travel of said wire,

an energy receiving means,

means for mounting said energy receiving means on the same side of the path of travel as said energy emitting means so that it receives energy reflected by said wire from said energy emitting means,

said energy receiving means including means sensitive to the presence and absence of reflected energy from said energy emitting means,

guide means made up of high wear-resistant material, each having openings for receiving said wire immediately before and after passing through said point of interception, for maintaining said wire in said predetermined path of travel,

each said guiding means including a reduced portion for receipt thereof into different openings formed in said mounting means,

said openings being arranged concentric with said path of travel of said wire,

said guiding means each having opposed enlarged portions on the side most adjacent said point of interception, and

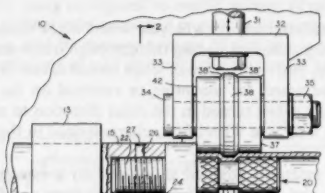
holding means for each guiding means carried by said mounting means and arranged to engage said enlarged portions of said guiding means for securing said guiding means to said mounting means.

4,114,414

BACKUP ROLL FOR THIN WALLED PIPE GROOVING DEVICE

James M. Goodman, East Rochester, N.Y., assignor to E.G. Sprinkler Corporation, East Rochester, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,249
Int. Cl.[2] B21D *17/04*
U.S. Cl. 72—105 **5 Claims**



1. In apparatus for roll grooving metal pipe and the like, and having a drive shaft and a grooving roll mounted for rotation about an axis parallel to said shaft, and for reciprocation radially of said shaft between operative and inoperative positions, the improvement comprising

a solid, cylindrical backup roll releasably secured to one end of said drive shaft coaxially thereof, and having a reduced-diameter operating section extending transverse to the path of reciprocation of said grooving roll, and adapted to project into one end of the pipe that is to be grooved,

said backup roll having a first transverse, work-engaging surface formed thereon at the inner end of said operating section to engage the terminal end of the pipe that is to be grooved, thereby properly to position the pipe on said operating section,

one of said rolls having thereon a circumferential boss, and the other of said rolls having therein a circumferential groove,

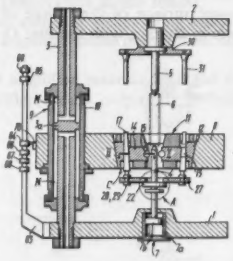
said backup roll having thereon a second transverse surface rearwardly of said first transverse surface engageable with said one end of said drive shaft when said groove in said other roll is disposed in registry with said boss on said one roll, whereby when one end of a piece of pipe is inserted over said operating section of the backup roll and against said work-engaging surface, and said grooving tool is moved radially to its operative position and said shaft is rotated, said circumferential boss will have rolling engagement with said pipe and will force a circumferential portion of said pipe into the registering groove in said other roll.

4,114,415

PROFILE PLANO-TYPE KNURLING MACHINE

Jury Mikhailovich Vodopyanov, ulitsa Depovskaya, 13, kv. 51; Nikolai Emelyanovich Klimkin, ulitsa P. Guschina, 75, kv. 27; Ivan Ivanovich Savvateev, ulitsa Molodezhnaya, 70, kv. 92; Vladimir Sergeevich Strelchenko, prospekt Lenina, 87, kv. 57; Alexandr Pavlovich Kuris, ulitsa Dekabristov, 6, kv. 7, and Sergei Ivanovich Koltsov, ulitsa Pobednaya, 78, all of Barnaul, U.S.S.R.

Filed Nov. 1, 1976, Ser. No. 737,775
Int. Cl.[2] B21B *17/00*
U.S. Cl. 72—214 14 Claims



1. An improved profile planotype knurling machine of the type having fixed support members; movable and fixed centers for placing a work piece, mounted on said fixed support members; ways rigidly coupling said fixed support members; a movable support member mounted between said fixed support members on said ways with a possibility for reciprocations along said ways; a knurling head with knurl rollers, mounted in said movable support member coaxially to said centers; the improvement comprising: means for moving said knurl rollers radially relative to said centers; a plurality of tapered elements mounted in said knurling head for providing adjustment motions axially relative to said centers said tapered members being associated kinematically with said knurl rollers; a unitary disc-shaped pressure member for providing the radial feed of said knurl rollers, and being mounted on one of said fixed support members facing the butt end of said tapered elements coaxially to said centers and adapted for contacting said actuating means during one motion of said reciprocations whereby said unitary disc-shaped pressure member and said actuating means cooperate to actuate simultaneously all said tapered elements; a plurality of return pressure members being mounted on one of said fixed support members opposite said unitary disc-shaped pressure member for returning said tapered elements to the starting position and said actuating means being located between said unitary disc-shaped pressure member and the bases of the tapered elements.

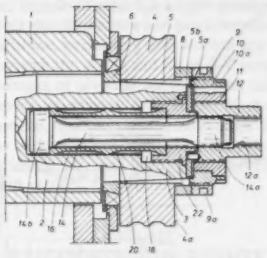
4,114,416

ROLLING DISC ATTACHMENT

Albert Bier, and Herbert Vogelgesang, both of St. Ingbert, Saar, Fed. Rep. of Germany, assignors to Moeller & Neumann GmbH, St. Ingbert, Saar, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 829,219
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639543
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—238 1 Claim

1. Apparatus for clamping an overhung rolling disc on a hollow drive shaft by compressive stress between plane parallel surfaces thereof, comprising a hydraulically expansible tie-rod insertable in the hollow drive shaft for producing the compressive stress, a tightening nut located opposite an outer end face of the rolling disc for transmitting the compressive stress, said tightening nut being seated on a bayonet ring provided with an external screw-thread, the bayonet ring with the tightening nut being supported by a bayonet nut, said bayonet nut being in turn screwed on a threaded end of the tie-rod and a taper sleeve being inserted between the rolling disc and drive



shaft, the free outer end face of said taper sleeve being located opposite an end face of the bayonet ring and being constructed for the attachment of extraction claws.

4,114,417

METHOD AND APPARATUS FOR MAKING METAL PARTS

Leon F. LaVene, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Jun. 27, 1977, Ser. No. 810,306
Int. Cl.[2] B21D *31/00*
U.S. Cl. 72—379 13 Claims

1. The method of making a bracket adaptor on the wall of a housing in which the adaptor is a generally rectangular cup protruding from a wall and is characterized by a peripheral groove on the exterior of said cup, the steps of forming a cup-shaped portion in the workpiece by applying a force in opposite direction on opposed surfaces of said workpieces with mating dies, said cup having a closed end with opposed pairs of parallel walls defining a rectilinear cross-section, holding walls of said cup adjacent to the surface of said workpiece against displacement in a direction parallel to the surface of said workpiece, and applying a force on the end wall of said cup to form oppositely extending flanges on opposed walls to form a continuous groove around the periphery of said cup adapted to receive a bracket therein, said holding of said walls being accomplished by holding members movable towards each other in response to movement of said dies towards each other.

4,114,418

MATERIAL HANDLING MEANS

David J. Jarman, P.O. Box 181, R.R. 3, Aurora, Ind. 47001

Filed Dec. 9, 1976, Ser. No. 748,937
Int. Cl.[2] B21D *43/00*
U.S. Cl. 72—386 15 Claims

1. In a combination with a mechanical press having a movable die and a fixed die, said movable die and said fixed die meeting at a bending axis, material handling means,

said material handling means comprising:

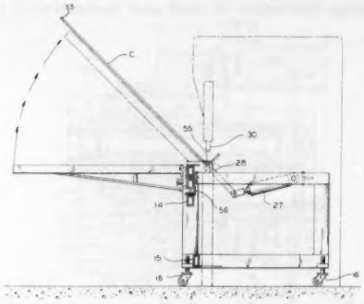
a base frame;

a lift frame;

said lift frame being pivoted to said base frame along a pivot axis,

said base frame and said lift frame positioning said pivot axis co-linearly with said bending axis; and

means to support material to be processed by said press brake,



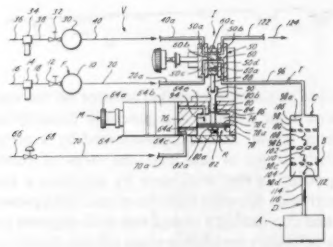
said material support means being laterally adjustably mounted to said lift frame.

4,114,419

METHOD OF TESTING AN ANALYZER TO DETERMINE THE ACCURACY THEREOF AND A VOLUMETRIC PRIMARY STANDARD APPARATUS FOR DOING SAME

Charles L. Kimbell, P.O. Box 40052, Houston, Tex. 77041

Filed Jun. 6, 1977, Ser. No. 803,675
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—1 G **14 Claims**



8. A method of testing an analyzer to determine the accuracy thereof, comprising the steps of:

flowing a carrier gas stream at a known flow rate;

periodically injecting a measured quantity of sample gas at selected intervals into the carrier gas stream as the carrier gas is flowing;

homogeneously mixing the carrier gas and the sample gas therewith in a mixing chamber for providing a homogeneous mixture of the sample gas and carrier gas at a substantially constant concentration, and,

flowing the homogeneous mixture into an analyzer whose accuracy is to be tested.

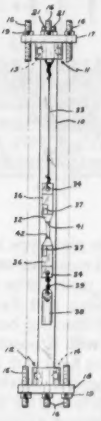
4,114,420

ENVIRONMENTAL TEST CHAMBER SYSTEM

Charles E. Browning, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,708
Int. Cl.[2] G01N *3/18*
U.S. Cl. 73—15.6 **2 Claims**

1. A test apparatus for determining the ability of a polymeric material to perform under load in various environments at high temperatures over given periods of time which comprises a top end-cap composed of a flange attached to a downwardly extending cylindrical member, the flange having holes formed therein around it periphery and the cylindrical member having a first groove formed in and extending around its inner wall; a first O-ring positioned in the first groove; a fastener attached to the lower surface of the flange at a location in the center of the circle formed by the intersection of the flange with the cylindrical member; a bottom end-cap composed of a flange attached to an upwardly extending cylindrical member, the flange having holes formed therein around its periphery and the cylindrical member having a second groove formed therein and extending around its inner wall; a second O-ring positioned in the second groove; an elongated, heat-resistant glass tube vertically disposed and having one of its ends positioned in the cylindrical member of the top end-cap so that its upper edge is in contact with the lower surface of the flange of the top end-cap and its surface is in contact with the first O-ring and



having the other of its ends positioned in the cylindrical member of the bottom end-cap so that its lower edge is in contact with the upper surface of the flange of the bottom end-cap and its surface is in contact with the second O-ring; a first wire having one of its ends attached to the fastener and vertically disposed in the tube; one end of a test specimen attached to the other end of the first wire and suspended above the level of water present in the tube; a second wire having one of its ends attached to the other end of the test specimen; a weight attached to the other end of the second wire; inlet and outlet ports formed in the flange of the top end-cap and leading into the chamber formed by the tube and the top and bottom end-caps; tie rods having threaded ends extending through corresponding, vertically aligned holes of the flanges; and nuts threaded onto the ends of the tie rods and tightened against the flange surfaces.

4,114,421

APPARATUS FOR MEASURING THE CONCENTRATION OF IMPURITIES WITHIN A SUBSTANCE

William R. Beall, Glendale, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed Mar. 8, 1977, Ser. No. 775,526
Int. Cl.[2] G01N *25/06*
U.S. Cl. 73—17 R **4 Claims**

1. An apparatus for measuring the concentration of impurities within a substance by the measurement of the reduction in freezing point of the substance, comprising in combination:

container means for receiving the substance;

said container means including a cell having an input and an output conduit for receiving and discharging the substance with a conduit valve means controlling the flow of the substance through said conduits;

temperature variation means established for changing the temperature of the substance within said container means;

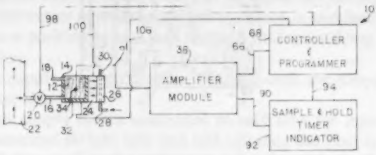
said temperature variation means including a thermoelectric device interposed between said container means and heat sink means for transferring heat from the substance in said container means to said heat sink means;

temperature sensor means mounted in thermal contact with the substance for providing a change in electrical characteristic in relation to a change in the temperature of the substance;

first amplifier means connected to said temperature sensor means for providing a first amplifier means output in accordance with the change in electrical characteristic of said temperature sensor means;

said first amplifier means being established for isolating said first amplifier means output from said first amplifier means input:

second amplifier means connected for receiving said first amplifier means output to provide a second amplifier



means output corresponding to the temperature variation of the substance;

control means connected for receiving said second amplifier means output to control said temperature variation means in accordance with a preselected standard;

third amplifier means comprising a differential amplifier having plural differential inputs and a third amplifier means output;

means connecting said first amplifier means output to one of said plural differential inputs of said third amplifier means;

a voltage source connected to the other of said plural differential inputs for biasing said third amplifier means to be sensitive to only a given magnitude of signal of said first amplifier means outputs; and

said third amplifier means output being amplified relative to the output of said second amplifier means and corresponding to only a portion of the output of said second amplifier means for providing a precision indication of the reduction in freezing point of the substance to indicate the associated impurities contained therein.

4,114,422

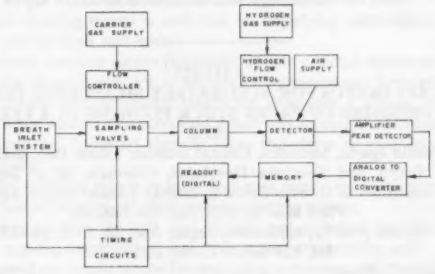
METHOD OF MONITORING DIET

Donald G. Hutson, 101 W. Nevin, Richmond, Calif. 94804

Filed Jan. 2, 1975, Ser. No. 537,911

Int. Cl.[2] G01N *31/08*

U.S. Cl. 73—23.1 **1 Claim**



1. The method of determining total body fat of a human subject comprising introducing a sample of alveolar air from said subject into a device capable of measuring both acetone and alcohol quantitatively in amounts at least as small as 1 microgram per liter and measuring the amount of alcohol and acetone in said sample to establish a base measure; introducing into said subject exactly known and predetermined amounts of alcohol and acetone, permitting said alcohol and acetone to be distributed through the water and fat of said subject, introducing another sample of alveolar air from said subject into said measuring device, measuring the amount of alcohol and acetone in said sample, determining the ratio of alcohol to acetone attributable to said introduced amounts of alcohol and acetone in the said alveolar air, and computing therefrom the total body fat of said subject.

4,114,423

DEVICE FOR MEASURING THE DENSITY OF LIQUID AND GASEOUS SUBSTANCES AND METHOD FOR OPERATING THE DEVICE

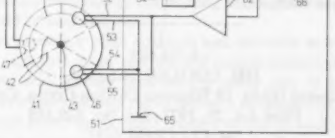
Alfred Wenger, Langenbruck, Switzerland, assignor to Institut Dr. Ing. Reinhard Straumann AG, Switzerland

Filed Mar. 30, 1977, Ser. No. 782,703

Claims priority, application Switzerland, Mar. 30, 1976, 3935/76

Int. Cl.[2] G01N *9/00*

U.S. Cl. 73—30 **16 Claims**



1. In a device for measuring the density of liquid and gaseous substances, and of the type including a plate to be introduced into the substance to be measured, at least one holder holding the plate at a holding point, an electronic unit, at least one vibration exciter connected to the electronic unit and operable to vibrate the plate, and at least one vibration detector connected to the electonic unit and operable to detect vibrations of the plate, the improvement comprising, in combination, a plate to be introduced into the substance to be measured; a holder holding said plate at only a single holding point; an electronic unit; at least one vibration exciter connected to said electronic unit and operable to vibrate said plate; and a vibration detector connected to said electronic unit and operable to detect vibrations of said plate; each vibration exciter being so positioned relative to said plate and so energized by said electronic unit acting, in conjunction with said exciters and said detector, as an oscillator, as to vibrate said plate in a manner such that two nodal lines intersect in the range of said single holding point.

4,114,424

GAS-FLUID-SOUND ISOLATION DOOR ASSEMBLY WITH INTEGRAL TESTING MEANS

Andrew P. Johnson, 1620 Kensington Rd., Bloomfield Hills, Mich. 48013

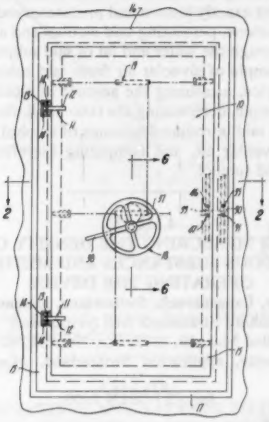
Filed Aug. 3, 1976, Ser. No. 711,219

Int. Cl.[2] G01M *3/32*

U.S. Cl. 73—40 **26 Claims**

1. An isolation door assembly including in combination a door frame, a door coaming adapted to be attached to said door frame in a flat plane, means to attach said door coaming to said door frame in said flat plane in such a manner as to provide a continuous sealed coaming annulus therebetween,

closeable means to admit pressure into said coaming annulus, a door hingedly mounted to said coaming, a sealing surface mounted about the periphery of said door, a complimentary sealing surface provided on said door coaming and adapted to



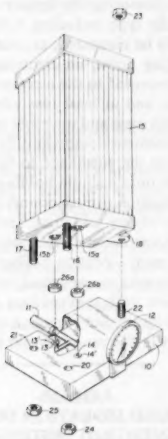
provide a continuous sealed door annulus, closable means to admit a test pressure into said door annulus, a door locking assembly operatively mounted to said door having at least one shaft penetrating said door, means to seal said shaft, and means to test said shaft seal.

4,114,425

OIL COOLER TESTER

Albert Edward Hicks, 10 Whitman Ct., San Carlos, Calif. 94070

Filed Jul. 29, 1977, Ser. No. 820,185
Int. Cl.[2] G01M *3/32*
U.S. Cl. 73—40 **6 Claims**



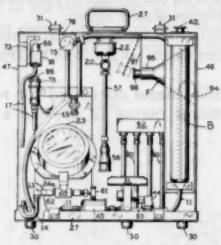
1. A device for testing for leakage in an oil cooler having oil inlet and outlet ports comprising: a block defining a fluid conduit therein; pressure measuring means connected to said conduit; said conduit having an entrance for introducing pressurized fluid; first and second ports on said block in fluid communication with said conduit; said first and second ports being spaced apart relative to the inlet and outlet ports of the oil cooler to be tested for sealable engagement therewith; and means on said block for removably attaching an oil cooler in sealed engagement between its oil inlet and outlet ports and said first and second ports.

4,114,426

LIQUID VOLUMETRIC LINE LEAK TESTING APPARATUS

F. Ronald McLean, 333 N. Ocean Blvd., Deerfield Beach, Fla. 33441

Filed Oct. 25, 1977, Ser. No. 845,443
Int. Cl.[2] G01M *3/08*
U.S. Cl. 73—40.5 R **30 Claims**



1. In an apparatus for detecting a leak in a gasoline line extending from an above-ground gasoline dispensing apparatus down to an underground gasoline storage tank provided with a check valve for preventing return flow of gasoline back down into the tank, the combination of:

a carrying case having a cover which may be opened to expose the interior of the case;

a burette extending vertically inside said case;

a person-operated pump in said case having its inlet connected to the lower end of said burette to receive makeup gasoline therefrom;

pressure gauge means in said case operatively connected to the outlet of said pump to display the latter's output pressure;

an air bleed device in said case having means therein for separating air from liquid;

a first long flexible hose in said case operatively connected between the outlet of said pump and said air bleed device;

a second long flexible hose in said case connected to said air bleed device and in liquid communication thereat with said first hose;

coupling means in said case for connecting the opposite end of said second hose to said gasoline line at said dispensing apparatus;

an air bleed hose in said case operatively connected at one end to said air bleed device to receive air and entrained liquid therefrom;

and a bleed valve in said case operatively connected between said air bleed hose and the top of the burette to control the flow of air and entrained liquid from said air bleed device through said air bleed hose to the top of the burette.

4,114,427

APPARATUS FOR ACCURATELY MEASURING THE FREENESS OF PAPER STOCK FLOWING IN A FEED PIPE

Yoshio Iguchi, Shizuoka; Chuichi Honma; Takesi Itoh, both of Tokyo, and Kazutaka Hosokawa, Odawara, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,358
Claims priority, application Japan, Apr. 18, 1975, 50-46513
Int. Cl.[2] G01N *11/06;* D21F *1/08*
U.S. Cl. 73—63 **5 Claims**

1. An apparatus for measuring freeness of fibrous material in paper stock flowing in a feed pipe, said apparatus comprising:

a closed dilution and agitation tank connected to said feed pipe, said tank having a quantifying portion connecting the interior of said pipe to the interior of said tank;

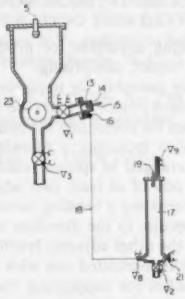
pumping means movably fitted through said tank and quantifying portion thereof into said feed pipe for removing a predetermined amount of stock from said feed pipe to said tank, said pump means comprising:

a plunger movably fitted through said tank, through said quantifying portion and into said feed pipe, said plunger having two spaced discs thereon slidably engaging said quantify portion, said discs spaced from each other a distance less than the length of said quantifying portion and at least one of said discs always engaging said quantifying portion; and

moving means for moving said plunger and said discs back and forth from said feed pipe to said tank through said quantifying portion, whereby moving said plunger back and forth causes the stock in said feed pipe to fill the space between said discs and be quantified during the movement of said space from a position in said feed pipe to a position in said tank through said quantifying portion;

water supply means connected to said tank for supplying water thereto;

first air supply means connected to said tank for injecting pressurized air into said tank and agitating the fluid in said tank from said water supply means and said feed pipe;



conduit means connected to said tank for withdrawing said water and paper stock from said tank;

screening means positioned within said conduit means for screening the fibrous material of said paper stock flowing through said conduit;

measuring means connected to said conduit means on the downstream side of said screening means for measuring the quantity of liquid passing through said screening means;

first and second draining means in said tank and said measuring means respectively for draining the fluids contained within said tank and said measuring means;

first cleaning means in said tank for supplying water thereinto to flush said tank;

second cleaning means positioned in said conduit means on the downstream side of said screening means and directed toward said screening means for supplying a stream of water against said screening means and forcing the fibrous material collected thereon away therefrom toward said tank;

third cleaning means in said measuring means for supplying water thereinto to flush said measuring means;

exhaust means through said dilution and agitation tank for opening the inside of said tank to the atmosphere; and

second air supply means for providing a pressure within said tank during the draining of the fluid suspension through said conduit means.

4,114,428

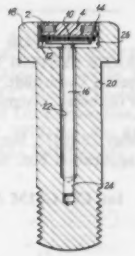
RADIO-FREQUENCY TUNED-CIRCUIT MICRODISPLACEMENT TRANSDUCER

Charles H. Popenoe, 6307 Wiscasset Rd., Bethesda, Md. 20016

Filed Sep. 24, 1976, Ser. No. 726,140

Int. Cl.[2] G01L 5/00

U.S. Cl. 73—88 F **8 Claims**



1. In a strain-stress detecting system comprising:

an elongated integral fastener member subject to elastic deformation when stressed wherein one portion thereof moves relative to another portion;

a resonant circuit assembly carried by said member, said assembly comprising a body of electrical insulating material on said member;

an electrical coil on one surface of said body;

a first capacitor plate on an opposite surface of said body and first means electrically connecting said capacitor plate to one end of said coil;

a second capacitor plate adjacent and movable toward and from said first plate and second means electrically connecting said second plate to the other end of said coil whereby said coil and plates define a resonant circuit; and

one of said plates being fixed relative to one of said portions of said member and the other plate being fixed relative to the other portion whereby elastic deformation of said member will vary the resonant frequency of said circuit.

4,114,429

METHOD OF AND APPARATUS FOR SENSING STRAIN IN STRAINED MEMBERS

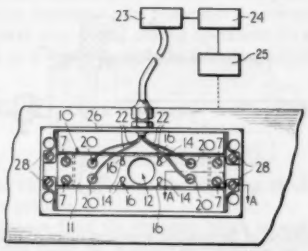
John Campbell Clark, Newport, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 13, 1976, Ser. No. 722,605

Claims priority, application United Kingdom, Oct. 28, 1975, 44324/75

Int. Cl.[2] G01B 7/16

U.S. Cl. 73—88.5 R **4 Claims**



1. A method of sensing strain in a strained member comprising accurately spacing mounting block means, removably securing the spaced mounting block means to a template, rigidly holding the mounting block means in accurately spaced desired positions on a member in which strain is to be sensed,

fixedly securing the mounting block means including the removable template to the member in which strain is to be sensed prior to the member being strained, removing the template from the mounting block means which are fixedly secured to the member in which strain is to be sensed, and securing a strain sensitive device to the spaced mounting block means for deriving a signal indicative of any subsequent strain existing in the member.

4,114,430

BRAKE SYSTEM TESTER

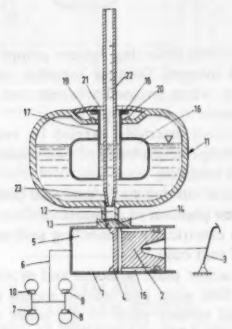
Hans-Henning Luepertz, Darmstadt, and Bernhard Fischenich, Kronberg, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,379

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623912

Int. Cl.[2] G01M *17/00*

U.S. Cl. 73—121 **3 Claims**



1. A method for locating defects in a hydraulic brake system with a master cylinder communicating with an outlet port of a compensating reservoir, characterized by sealingly placing a burette on the outlet port in order to respectively measure and ascertain the volume of brake fluid that flows from the master cylinder to the compensating reservoir after the brake has been applied.

4,114,431

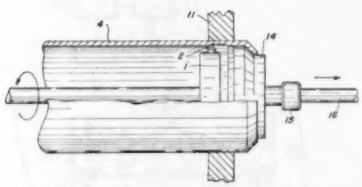
METHOD OF FORMING TUBULAR METAL PRODUCTS

Edwin R. Monkelbaan, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1976, Ser. No. 652,934

Int. Cl.[2] B21D *3/02*

U.S. Cl. 72—122 **6 Claims**



1. A method of fabricating seamless tubes of malleable metal including the following steps:

preparing an annular work piece of greater wall thickness than the required thickness of the completed tube;

supporting the work piece within a die ring in encircling engagement with its outer surface;

applying an axial pull to one end of said work piece to draw it axially through said die ring and simultaneously centrifugally rolling the rollers of a forming tool against the interior surface of said work piece, while said work piece is encircled by said die ring, with solely centrifugal force sufficient to enlarge by deformation its internal diameter and axially lengthen the work piece, said centrifugal rolling being accomplished by spinning said tool at a high rotational speed.

4,114,432

COIL WINDING APPARATUS

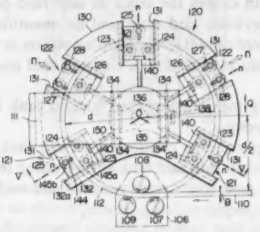
Yoshio Miura; Kazuhiro Kobayashi, and Koue Yusa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 17, 1977, Ser. No. 797,691

Claims priority, application Japan, May 24, 1976, 51-59151

Int. Cl.[2] B21F *3/02*

U.S. Cl. 72—135 **10 Claims**



1. A coil winding apparatus for producing a coil from a linear, elongated object, comprising:

a bending roller assembly for imparting a bending moment to the elongated object to form the coil; and

a leveling device for correcting the diameter of the coil, said leveling device including a plurality of leveling roller assemblies arranged in spaced relation circumferentially of the coil, one of at least two adjacent leveling roller assemblies imparting a bending mement to the coil in the direction opposite to the direction of a bending moment imparted by the other adjacent leveling roller assembly to the coil, sliders associated one with each of said leveling roller assemblies for supporting the same, each of said sliders having at one end thereof a threaded shaft, and a rotational driving source for rotating said shafts to simultaneously radially slide said sliders.

4,114,433

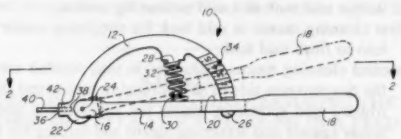
TURNBUCKLE WRENCH FOR TENSIONING SAILBOAT MAST STAYS

Charles E. Bowen, 2701 Fairway Dr., Greensboro, N.C. 27408

Filed Sep. 12, 1977, Ser. No. 832,326

Int. Cl.[2] G01L *5/06*

U.S. Cl. 73—143 **10 Claims**



1. A turnbuckle wrench for imparting desired tension to a mast stay connected to a sailboat by an elongate turnbuckle rotatable about its longitudinal axis and having an opening extending laterally therethrough, said wrench comprising:

first and second elongate lever members each having a forward end and a rearward end;

means pivotally innerconnecting said lever members adjacent said forward ends thereof;

spring means innerconnecting said lever members intermediate the lengths thereof for resiliently maintaining a predetermined pivotal positional relationship between said lever members while yieldingly permitting pivotal movement of said lever members relative to each other;

an elongate pin-like element carried by ar d projecting forwardly from said first lever member for reception during use of said wrench within said opening of said turnbuckle;

said second lever member having a handle portion adjacent said rearward end thereof for receiving thereon during use of said whench a manually-applied force adapted to impart stay-tensioning rotative movement to said turnbuckle; said force being transmitted from said second lever member to said pin-like element through said first lever member and through said spring means innerconnecting said lever members, and increasing magnitude of said force causing resilient yielding of said spring means and proportionally increasing pivotal movement of said lever members relative to each other;

and indicia means upon at least one of said lever members for indicating the magnitude of the relative pivotal movement undergone by said lever members as stay-tensioning rotative movement is imparted by said wrench to said turnbuckle, and for thereby indicating the magnitude of the tension imparted to said stay.

4,114,434
DEVICE FOR MEASURING THE ADHESION FORCES IN A CLOSURE SEAL FOR A CONTAINER AND A METHOD OF OPERATING THIS DEVICE

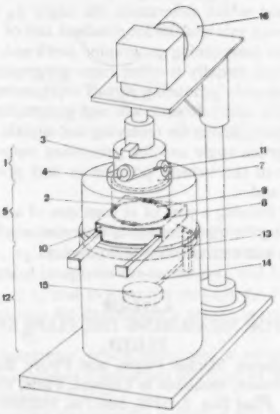
Ivo Hauser, White Plains, N.Y., assignor to Societe d'Assistance Technique pour Produits Nestle, S.A., La Tour-de-Peilz, Switzerland

Filed May 9, 1977, Ser. No. 795,031

Claims priority, application Switzerland, May 19, 1976, 6239/70

Int. Cl.[2] G01N *19/04*

U.S. Cl. 73—150 R **7 Claims**



1. A device for measuring the adhesion forces in a closure seal of a container, the seal being formed by a membrane adhering to the neck of a container and by a pad retained at the base of the cover of the container, adhering together, said device comprising a plunger with an adhesive end equipped with lateral guides, a skirt encircling said plunger and having an upper edge in the form of inclined planes adapted to receive the lateral guides of the plunger, and a shoe having a base which is provided with means for retaining the pad, rotation of said plunger about a fixed axis causing said plunger to move axially and thereby effect separation of said membrane from said pad, the shoe being connected to a dynamometer whereby the force required to effect such separation is transmitted to said dynamometer.

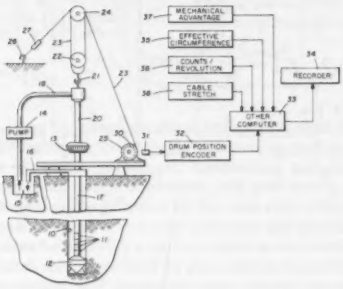
4,114,435
WELL DRILLING SYSTEM

Bobbie J. Patton, Dallas; James H. Sexton, Duncanville; Wilton Gravley, Carrollton, and C. Mackay Foster, Jr., Denton, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,647

Int. Cl.[2] E21B *47/00*

U.S. Cl. 73—151.5 **4 Claims**



1. In a method for drilling a well with a drill bit fixed to the lower end of a drill string suspended from a traveling block moving in response to movement of a cable extending from a drawworks drum and arranged over one or more sheaves mounted in a crown block, the steps comprising:

(a) lowering the traveling block to its lowest position,

(b) measuring the distance from said lowest position of the traveling block to a selected reference point,

(c) determining the rotational position of the drum for said lowest position of the traveling block,

(d) raising the traveling block to a second position at which one full layering of cable is wound onto the drum,

(e) measuring the distance from said position of the traveling block to said reference point,

(f) determining the rotational position of the drum for said second position of the traveling block,

(g) repeating steps (d) - (f) for each full layering n of cable wound onto the drum before the traveling block reaches its maximum distance above said reference point, and

(h) thereafter determining the position of the traveling block at any given time during drilling operations for any cable layering in accordance with the following expression:

$$X' = X - (T_n - T_0) + \left(\frac{T_n - T_{n-1}}{C_{n-1} - C_n}\right)(C' - C_n)$$

wherein,

X = the value of X' when the traveling block is in its lowest position,

T_n = distance from the traveling block to said selected reference point for n layers of cable wound onto the drum,

T_O = distance from the lowest position of the traveling block to said selected reference point,

C_n = rotational position of the drum for n layers of cable wound onto the drum, and

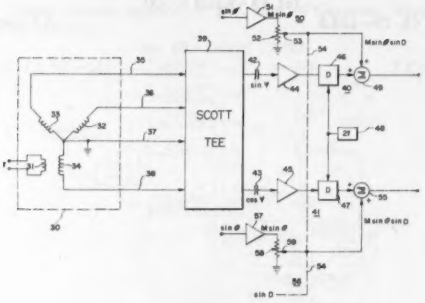
C' = rotational position of the drum at any given time.

4,114,436

"STRAPDOWN" INDUCTION COMPASS TRANSMITTER WITH COMPENSATION FOR HEADING ERRORS DUE TO THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD AND DUE TO TWO CYCLE ERROR DURING TURNS AND DURING CLIMBING AND DIVING MANEUVERS

John Edward Suminsby, 65 Arbor St., Wenham, Mass. 01984

Filed Dec. 20, 1976, Ser. No. 752,264
Int. Cl.[2] G01C 21/00
U.S. Cl. 73—178 R 5 Claims



1. In a strapdown induction compass transmitter compensated for errors due to the Earth's vertical field during turns and during climbing and diving maneuvers, comprising:

(a) magnetic sensing means for producing modulated signals proportional to the strength of the Earth's magnetic field along the fore/aft and athwartships axes,

(b) means to demodulate the modulated signal representative of the sensed fore/aft field to produce a varying DC signal which is proportional to the sensed Earth's field and thus to the cosine of the magnetic heading angle ψ,

(c) means to demodulate the modulated signal representative of the sensed athwartships field to produce a varying DC signal which is proportional to the sensed Earth's field and thus to the sine of the magnetic angle ψ,

(d) means to compensate said demodulated signals for errors due to the Earth's vertical field during turns, including;

(1) means to generate a first DC correction signal proportional to the product of the Earth's magnetic field M, the sine of the magnetic dip angle D, and the sine of the bank angle ϕ,

(2) means to generate a second DC correction signal proportional to the product of the Earth's magnetic field M, the sine of the magnetic dip angle D, and the sine of the pitch angle θ,

(3) means to add said first correction signal algebraically to the demodulated DC signal representing the product of the Earth's magnetic field and the sine of the magnetic heading angle ψ, and

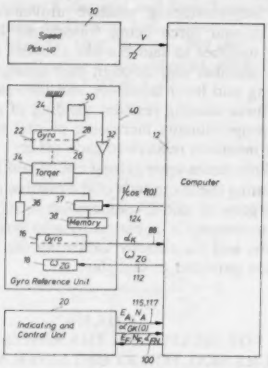
(4) means to add said second DC correction signal algebraically to the demodulated DC signal representing the product of the Earth's magnetic field and the cosine of the magnetic heading angle ψ, to cancel the signal component due to the Earth's vertical field sensed along the athwartships axis during turns and along the fore-/aft axis during climbing and diving maneuvers.

4,114,437

NAVIGATION INSTRUMENT FOR THE NAVIGATION OF LAND VEHICLES

Uwe Krogmann, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk, Bodensee, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,153
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659094
Int. Cl.[2] G01C 21/00
U.S. Cl. 73—178 R 9 Claims



1. A navigation instrument for the navigation of land vehicles in a grid coordinate system having a north direction which does not necessarily coincide with geographic north but may differ therefrom by a grid convergence angle, said instrument being characterized by:

(a) movement pick-up means for generating a signal representing the magnitude of longitudinal movement of the vehicle;

(b) a gyro reference device including

free gyro means whose spin axis establishes a reference axis and which determines the angle α_K between the reference axis and the longitudinal axis of the vehicle,

means for determining geographic north and, if said reference axis initially is offset from geographic north, for subsequently producing signals representing the angles between said reference axis and geographic north;

(c) a computer device for receiving said signals and said grid convergence angle and for generating output signals indicative of the vehicle position in said grid coordinate system; and

(d) means forming a part of at least one of said devices for correcting for the influence of the rotation of the earth on the spin axis and said free gyro means.

4,114,438

DEVICES FOR MEASURING THE FLOW SPEED OF A FLUID

Jean-Max Muraz; Michel Payre, and Pierre Rampin, all of Valence, France, assignors to Crouzet, Paris, France

Filed Dec. 8, 1976, Ser. No. 748,495
Claims priority, application France, May 22, 1978, 78 37893
Int. Cl.[2] G01F 1/66
U.S. Cl. 73—194 A 2 Claims

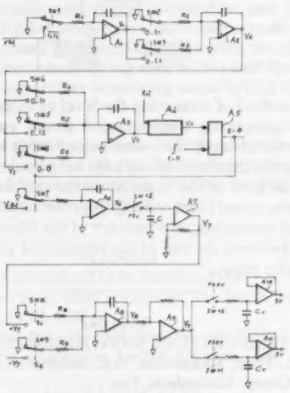
1. A device for measuring the flow speed of a fluid, comprising at least a pair of electro-acoustic transducers placed in the fluid, means generating a pulse train for triggering said transducers, each operating as a transmitting probe, to transmit simultaneously a succession of acoustic waves during a time interval shorter than the time interval taken by the acoustic waves to travel between said transducers, transforming means for processing respectively the received electric signals delivered by each of said transducers operating as receiving probes, in order to get information representing the phase difference

between the received signals delivered by one of said receiving probes and the received signals delivered by the other receiving probe, said transforming means comprising:

a first integrator which integrates a reference voltage between moments 0, corresponding to the beginning of the transmission time interval, and t_1, or t_2 if $t_2 < t_1$, t_1 and t_2 representing the propagation times of the acoustic waves from one probe to the other in both directions, said reference voltage being switched to the input of said first integrator by an analog switch;

a second integrator which integrates the output voltage of said first integrator switched to the input of said second integrator by analog switches between 0 and t_1, or t_2 if $t_2 < t_1$, with a time constant $\tau/2$, and between t_1 and t_2, or t_2 and t_1 if $t_2 < t_1$, with a time constant τ;

a third integrator which integrates the output voltage of said second integrator switched to the input of said third integrator by analog switches between 0 and t_1, or t_2 if $t_2 < t_1$, with a time constant τ_1, between t_1 and t_2, or t_2 and t_1 if $t_2 < t_1$, with a time constant τ_2, and until moment θ with a time constant τ_3, where moment θ is determined by the comparison of the output voltage of said third integrator



with a reference voltage by a comparator, the time constants τ_1, τ_2, τ_3, being chosen so as to cancel at the output of said third integrator the terms in t_1^3 and $t_1t_2^2$, or t_2^3 and $t_2t_1^2$ if $t_2 < t_1$, and to keep the terms in $t_1t_2\theta$;

a trigger circuit for developing a square wave pulse of life time $0 - \theta$;

a fourth integrator which integrates a reference voltage between moments 0 and θ and develops an output voltage proportional to K/t_1t_2;

a memory unit for storing the output of said fourth integrator after a time lag greater than the maximum duration of $0 - \theta$;

a fifth integrator which receives square wave pulses modulated in amplitude by the output of said fourth integrator stored in said memory unit and in width by $\Delta t = t_2 - t_1$, or $t_1 - t_2$ if $t_2 < t_1$, and which supplies an output voltage proportioned to the product $K\ \Delta t/t_1\ t_2$

an amplifier responsive to the output from said fifth integrator for performing a scaling operation which, after a time greater than the maximum propagation time, is sampled and stored on an output corresponding to a measuring channel for one of said transducer pairs.

4,114,439

APPARATUS FOR ULTRASONICALLY MEASURING PHYSICAL PARAMETERS OF FLOWING MEDIA

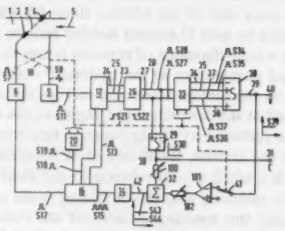
Willy Julius Fick, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 18, 1977, Ser. No. 825,647

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636737

Int. Cl.[2] G01F 1/66

U.S. Cl. 73—194 A **4 Claims**



1. Apparatus for ultrasonically measuring physical parameters of flowing media, comprising, a measuring path provided with two ultrasonic converters, transmitting and receiving devices connected to said converters, said path having at least one component in the direction of flow and over which ultrasonic signals are sent alternately upstream and downstream, control means for applying a starting signal to said transmitting device, switch means operated by said control means for alternately connecting said transmitter and receiver to opposite ones of said converters, comparator means connected to said receiving device and having an input for a reference signal from said control means applied thereto at a predetermined time after the time of said transmitter starting signal, said comparator means generating early or late signals when arrival signals from said receiving device come in earlier or later than said reference signal, a first signal level generator connected to said comparator means for producing a first main signal related to the velocity of sound in said media, a logic circuit connected to said comparator means and said control means, a second signal level generator connected to said logic circuit for producing a second auxiliary signal related to the flow velocity of said media, a summating circuit having inputs connected to said first and second generators, a time generator having an input connected to said summating circuit and an output connected to said control means, switch and reversing amplifier means between said summating circuit and said second signal level generator controlled by said control means for alternately adding and subtracting said auxiliary flow velocity signal to and from said summating circuit to provide sum and difference outputs for said summating circuit, first variable resistor means between said summating circuit and said first signal generator for adjustably varying said main signal, and second variable resistor means between said summating circuit and said second signal generator for varying said auxiliary signal.

4,114,440

TURBINE-TYPE FLOW RESPONSIVE DEVICE

W. Mead Stapler, One Dey Lane, Riverdale, N.J. 07457

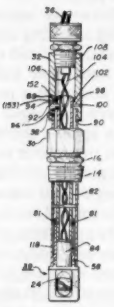
Filed Oct. 19, 1977, Ser. No. 843,527

Int. Cl.[2] G01F 1/115

U.S. Cl. 73—231 R **10 Claims**

1. A turbine-type flow responsive device characterized in that the turbine is of molded plastic and has molded therein a magnetic attraction means disposed to cause an electrical pulse to be actuated when said turbine is rotated and the enclosed magnetic means is passed by a magnetic pickup, said flow responsive device disposed for mounting in a hydraulic connection to a through fluid passageway of determined size such

as a pipe, said flow responsive device reading the flow rate in said passageway and including: (a) a tubular stem portion which is at least two inches greater in length than the hydraulic connection in which it is to be mounted, said stem having a diameter which is less than the inner diameter of the hydraulic connection in which it is mounted; (b) means for mounting said stem portion in the hydraulic connection and in and through the wall of the fluid conductor and means for orienting and securing said stem in said hydraulic connection so that fluid is prevented from leaking past the mounted stem portion; (c) a U-shaped turbine mount removably secured to and extending from the inner end of the tubular stem; (d) a shaft supported and retained by said U-shaped turbine mount; (e) a turbine of small size whose diameter of rotation is less than the diameter of the fluid passageway in the hydraulic connection which is mounted on the tubular stem, said turbine rotatably supported on the shaft at substantially right angles to the axis of the stem so that the turbine may freely rotate in response to the flow of fluid past the turbine, the diameter of rotation of the turbine being such a small size in relation to the fluid passageway in which it is mounted that the confining walls of the fluid passageway and the resulting distance of the walls to the turbine negate a shroud effect of the walls on the fluid flow read by the



turbine, the turbine hub carrying a permanent magnetic device in a manner to provide a balanced turbine, said U-shaped turbine mount assembly and the bladed turbine in mounted condition thereby providing forward, rear and below protection of the turbine with the below connection extending beyond the sweep of the turbine to act as a guard against accidental engagement of the turbine with an interior wall of the fluid conducting passageway and to insure that the turbine blades are a determined spacing from the wall of this passageway; (f) a magnetic pickup carried within and near the end of the tubular stem and adapted to be actuated by the rotation of the turbine; (g) a conductive means attached to the pickup and from this pickup carried within and extending from the stem portion outside the fluid conductor so as to carry from this stem portion pulse signals to an external computing and display means so that when and as the turbine is positioned in the passageway of the fluid conductor with the axis of the turbine and the passageway substantially in coincidence the turbine is caused to be rotated in response to and in relation to the rate of flow of fluid along the passageway, and (h) an O-ring seal carried by the turbine mount and an outer tubular member portion of the stem to provide a fluid-tight seal of the removable mount in the end of the stem.

4,114,441

METHOD AND APPARATUS FOR MEASURING THE HEIGHT OF FILLING MATERIAL ON A SURFACE, SUCH AS WITHIN A CONTAINER

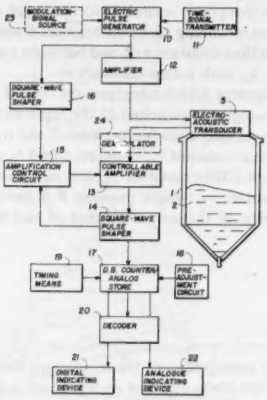
Antonio Magri, Milan, Italy, assignor to G. H. Endress & Co., Switzerland

Filed May 23, 1977, Ser. No. 799,517

Claims priority, application Switzerland, Jun. 9, 1976, 7228/76

Int. Cl.² G01F *23/28*

U.S. Cl. 73—290 V **13 Claims**



1. A method of measuring the level of filling material on a surface, comprising transmitting a sound pulse toward the filling material level, the sound pulse having a duration equal to at least the time it would take the sound pulse to travel to the lowermost level of the material on the surface, recording the echo of the sound pulse coming from the actual material filling level, and measuring, as a measure of the filling level, the time interval between the end of the transmitted pulse and the end of the echo pulse.

4,114,442

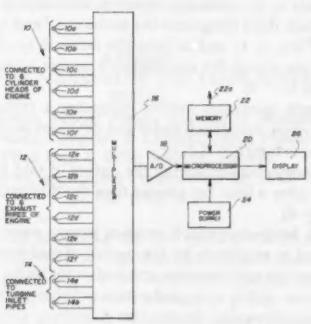
TEMPERATURE MONITORING SYSTEM

Wayne L. Pratt, Richardson, Tex., assignor to Avicon Development Group, Richardson, Tex.

Filed Sep. 3, 1976, Ser. No. 720,406

Int. Cl.² G01K *7/04, 7/14*

U.S. Cl. 73—341 **24 Claims**



1. A monitoring device for monitoring thermal operating characteristics of an engine including turbine and piston engines comprising:

a first plurality of thermocouples located in first temperature

monitoring zones within the engine for measuring the temperature of said first temperature monitoring zones and for generating corresponding first temperature output signals;

a second plurality of thermocouples located in second temperature monitoring zones within the engine for measuring the temperature of said second temperature monitoring zones and for generating corresponding second temperature output signals;

a third plurality of thermocouples located in third temperature monitoring zones within the engine for measuring the temperature of said third temperature monitoring zones and for generating corresponding third temperature output signals;

a multiplexing circuit for automatically and sequentially scanning and detecting said first, second and third temperature output signals;

means for converting said scanned temperature output signals to digital information;

an electronic processor for continuously generating a first temperature difference signal representing the temperature difference between the hottest and coldest zone of said first temperature monitoring zones, a second temperature difference signal representing the temperature difference between the hottest and coldest zone within said second temperature monitoring zones and a third temperature difference signal representing the temperature difference between the hottest and coldest zone within said third temperature monitoring zones;

means for storing said digital information and said first, second and third temperature difference signals;

first display means for alternately displaying the number of the temperature monitoring zone within said first, second and third temperature monitoring zones having the hottest temperature;

second display means for alternately displaying said first, second and third temperature difference signals; and

third display means for alternately displaying the temperature of the hottest zone within said first, second and third temperature monitoring zones.

4,114,443

FREEZE THAW INDICATOR

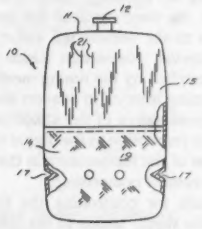
Trevor Percival Clark, 3650 Sunnycrest Dr, North Vancouver, B.C., Canada (V7R 3C6)

Filed Jun. 21, 1976, Ser. No. 697,716

Claims priority, application United Kingdom, Jun. 26, 1975, 27054/75

Int. Cl.[2] G01K *11/06*

U.S. Cl. 73—358 **4 Claims**



1. A freeze thaw indicator for evidencing thawing conditions in a food storage compartment of a freezer comprising:

(a) a container having an upper transparent portion and a lower opaque portion adapted to be partially filled with a coloured liquid within only the opaque portion having substantially the same thawing temperature as water,

(b) a plurality of projections extending inwardly from side walls of the opaque portion of the container for inhibiting movement of frozen liquid into the transparent portion of the container but permitting movement of melted liquid into the transparent portion when the container is placed in a horizontal position.

4,114,444

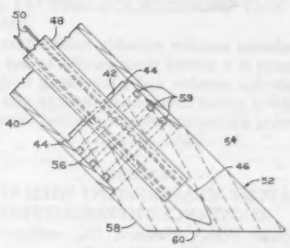
MEASURING GLASS SURFACE TEMPERATURE DURING ANNEALING

Ernest N. Schwenninger, and Ronald L. Schwenninger, both of Cumberland, Md., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 5, 1977, Ser. No. 757,122

Int. Cl.[2] G01K *7/02*

U.S. Cl. 73—359 R **5 Claims**



1. Apparatus for determining the temperature at a fixed position within a glass annealing lehr of a main portion of a moving glass ribbon to be cut into blanks of commercially acceptable glass having acceptable optical properties, when said portion passes said fixed position, comprising a temperature sensing element, a plug of boron nitride of generally cylindrical configuration having a lower portion including a surface adapted for sliding contact with said moving glass ribbon at said fixed position, a recess spaced a predetermined distance substantially greater than four microns from said exposed surface of said plug, and an upper portion, a temperature sensing element carried by said plug within said recess, said temperature sensing element comprising wires that spoil the optical properties of a moving glass ribbon on relative sliding contact therewith, said plug of boron nitride providing a thermal conductive path from the contacted surface of the moving glass ribbon to said temperature sensing element while providing electrical insulation between the temperature sensing element and the glass surface and protection for the ribbon from sliding contact with said wires of said temperature sensing element, and tube means surrounding said upper portion of said plug, said lower portion of said plug having a slightly larger radius than its said upper portion, whereby said exposed surface of said plug is the only portion of said apparatus adapted to make sliding contact with said main portion of said moving glass ribbon.

4,114,445

ELECTRICAL THERMOSTAT CONTROL APPARATUS

Marvin D. Nelson, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 18, 1977, Ser. No. 798,214

Int. Cl.[2] G01K *7/14*

U.S. Cl. 73—360 **8 Claims**

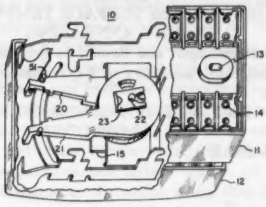
1. In a temperature sensing unit adapted for use in an electrical control system for temperature conditioning apparatus comprising;

a base member (adapted to be mounted on a surface.)

an electrical circuit having a plurality of circuit components associated with a temperature responsive means for changing the operation of the temperature conditioning apparatus, said circuit components being mounted on said base,

a first selector member movably mounted on said base for

movement in a plane parallel to said base and cooperating with one of said plurality of components, said selector member having an open portion laying over a second of said plurality of circuit components, and



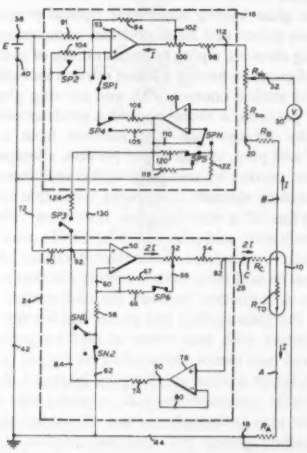
second selector member movably mounted on said base for movement in a second plane parallel to and adjacent said first selector member and cooperating with said second plurality of circuit components through said open portion to provide a compact selector member assembly.

4,114,446

TEMPERATURE MEASUREMENT WITH THREE LEAD RESISTANCE THERMOMETERS

Thomas Joseph Walsh, Hatboro, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 13, 1976, Ser. No. 750,075
Int. Cl.[2] G01K 7/24
U.S. Cl. 73—362 AR **6 Claims**



1. Apparatus for producing a constant current through a load resistor from a constant potential source having one terminal common with a terminal of said load resistor, comprising:

a calibrating resistor,

a first operational amplifier,

means connecting the output circuit of said first amplifier to said load resistor through said calibrating resistor,

a first circuit resistor,

means connecting the inverting input of said first operational amplifier to one terminal of said constant potential source through said first circuit resistor,

a second circuit resistor having a value with a predetermined relationship to that of said first resistor,

means connecting the output of said first amplifier through said second circuit resistor to said inverting input to form with said first circuit resistor a feedback circuit for said first amplifier,

a third circuit resistor,

means connecting the non-inverting input of said first amplifier to the other terminal of said constant potential source through said third circuit resistor,

a fourth resistor having a value with a predetermined relationship to the value of said third resistor which corresponds to the relationship of said first resistor to said second resistor,

a second operational amplifier having its output terminal connected by a feedback circuit to its inverting input,

means for connecting the non-inverting input of said second amplifier to the other terminal of said calibrating resistor, and

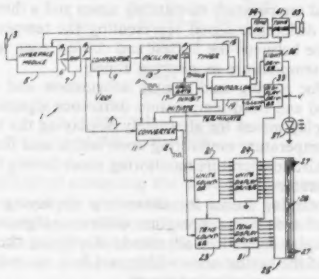
means connecting said fourth resistor between the output terminal of said second amplifier and the non-inverting input of said first amplifier.

4,114,447

TEMPERATURE INDICATING APPARATUS

Wally E. Creach, Tulsa, Okla., assignor to La Barge, Inc., St. Louis, Mo.

Filed Feb. 9, 1976, Ser. No. 656,428
Int. Cl.[2] G01K 7/24
U.S. Cl. 73—362 AR **9 Claims**



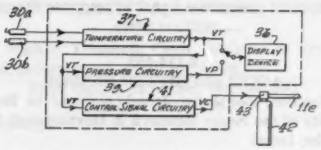
1. In temperature indicating apparatus having means for sensing the temperature in a region having a temperature to be measured and for supplying an analog signal whose amplitude is a function of the temperature therein, means for comparing the analog signal amplitude with a reference level which represents a preselected temperature level and for supplying a signal when the analog signal amplitude reaches the reference level, means responsive to the signal from the comparing means for supplying pulses at a predetermined rate, timing means responsive to the pulses for counting from zero to a preselected value and for supplying an enabling signal when the preselected value is reached, the time required for the timing means to count from zero to the preselected value being a predetermined timing interval, conversion means responsive to the enabling signal supplied by the timing means at the end of the predetermined timing interval to convert the analog signal to a digital signal representative of the temperature in the region, and display means responsive to the digital signal for providing a visual indication of the temperature in the region being measured, the improvement comprising:

controller means for controlling the supplying of pulses from the pulse supply means to the conversion means and for controlling the initiation of the conversion of the analog signal to the digital signal, said controller means including means responsive to the enabling signal supplied by the timing means at the completion of the predetermined interval for supplying an initiate signal to the conversion means, said conversion means being responsive to said initiate signal to initiate the conversion of the analog signal, whereby the conversion means starts production of the digital signal representative of the temperature in the region only at the end of the predetermined timing interval.

4,114,448
SERVICING APPARATUS

Joseph E. Merritt, 8061 8th St., Buena Park, Calif. 90621

Filed Sep. 13, 1976, Ser. No. 722,777
Int. Cl.[2] G01K 7/22; G01L 9/00
U.S. Cl. 73—362 AR 8 Claims

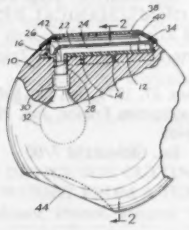


1. The combination comprising:
temperature-sensitive means, comprising a positionable probe, for producing a probe-signal corresponding to the temperature of the probe-environment having a known pressure/temperature relationship;
means for transposing said probe-signal to a temperature-signal;
means for transforming said temperature-signal to a temperature readout corresponding to the temperature at said probe-environment;
alternative means for electronically converting said temperature-signal to a pressure readout corresponding to the pressure at said probe-environment;
said converting means comprising means for synthesizing a pressure/temperature curve corresponding to said pressure/temperature relationship;
said synthesizing means comprising a set of generator means for synthesizing said pressure/temperature curve.

4,114,449
SQUEEZE TYPE EXERCISER DEVICE WITH FORCE MEASURING GAUGE

Forrest L. Dikeman, 2925 NE. 77th Ave., Portland, Oreg. 97213, and Robert C. Wilkinson, 11855 SW. 91st St., Tigard, Oreg. 97223

Continuation of Ser. No. 715,436, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 576,674, May 12, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,496
Int. Cl.[2] A63B 21/30; G01L 5/02
U.S. Cl. 73—379 2 Claims

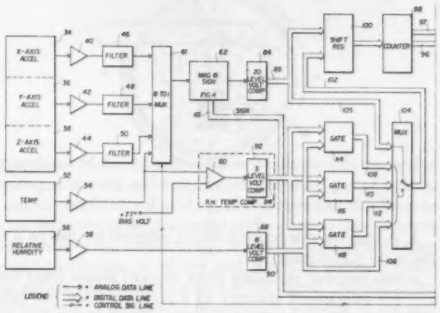


1. A body exerciser device, comprising:
a. an elastic compression body, and
b. a gauge integral with and confined within the periphery of the elastic compression body throughout the operating range of the gauge, the gauge comprising:
1. a resiliently deformable fluid reservoir confined within and surrounded by the elastic compression body, the reservoir being encapsulated within the body with substantially the entire external surface of the reservoir bonded to and in direct contact with said body,
2. compression indicating means communicating within the reservoir and bonded integrally to the body and confined within the periphery of the elastic compression body throughout its operating range, the indicating means being visible at the periphery of the body, and
3. indicating fluid contained within the reservoir and operable upon compression of the elastic body to compress the reservoir and register said compression on the visible indicating means.

4,114,450
ELECTRONIC RECORDING ACCELEROMETER

Lawrence M. Shulman, East Patchoque, and Norman Weingart, Syosset, both of N.Y., assignors to Systems Consultants, Inc., Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 846,975
Int. Cl.[2] G01D 1/14, 21/02; G01P 15/00
U.S. Cl. 73—489 15 Claims



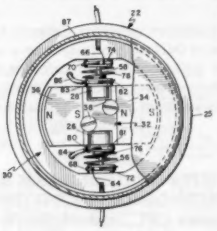
1. Apparatus for sensing and recording, for subsequent retrieval, environmental data such as shock, temperature and relative humidity, comprising, in combination:
a substantially ruggedized case for housing said apparatus in the form of a simulated parcel and including a power source therein for operating said apparatus over a predetermined period of time such as the time required for shipping said case from one destination to another;
a plurality of environmental data sensors located in said case and being operable to be responsive at least to shocks encountered bidirectionally along three mutually perpendicular axes and providing respective analog output signals having amplitudes which are a measure of the magnitude of the respective shocks encountered;
analog signal multiplexer circuit means coupled to said plurality of data sensors and being operable to provide a repetitive multiplexed sequence of data signal samples of said analog output signals;
electrical circuit means coupled to said signal samples and being responsive thereto to classify each of said data signal samples by means of voltage comparator circuit means into amplitude windows of predetermined increments and including encoding means for generating a multi-bit digital code word corresponding to the largest amplitude window reached by each data signal sample;
a statistical digital memory coupled to said electrical circuit means and having a respective addressible memory location for each digital code word and being operable to statistically count and store in binary format at each memory location the number of respective digital code words generated over a predetermined sampling period;
a time tagged digital memory coupled to said electrical circuit means and having time dependent addressible memory locations for a predetermined number of sampling periods and being operable in one mode to selectively store in binary format the largest value of a code word occurring within at least one sampling period and in another mode to store in binary format the number of time periods wherein code words of less than a minimum amplitude window are generated; and

means coupled to said digital memory for selectively reading out on demand the binary formats of said memory locations for generating statistical and time histories of the data stored therein.

4,114,451
MOVING COIL MINIATURE ANGULAR RATE SENSOR

Jack H. Crittenden, Ontario, and Joseph W. Bitson, Chino, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 11, 1977, Ser. No. 823,580
Int. Cl.[2] G01P *9/02*
U.S. Cl. 73—504 **17 Claims**



1. A steering rate sensing device adapted for use on a rotating body comprising:

a base member including pivot support means fixed thereto for attachment directly to a rotating body for rotation therewith about a rotary axis, said pivot support means defining a pivot axis extending at an angle to said rotary axis,

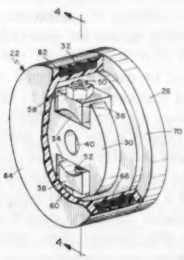
magnetic means fixed to said base member for rotation therewith, and

a pickoff coil pivotally mounted on said pivot support means on said base member for rotation therewith, and for movement about said pivot axis relative to said magnetic means by gyroscopic precession in response to change in orientation of said rotary axis during rotation thereof for generating a signal.

4,114,452
MOVING MAGNET MINIATURE ANGULAR RATE SENSOR

Joseph W. Bitson, Chino, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 11, 1977, Ser. No. 823,817
Int. Cl.[2] G01P *9/02*
U.S. Cl. 73—504 **15 Claims**



1. A steering rate sensing device for a rotating body comprising:

a base member adapted to be mounted on and rotated with a rotating body about a rotary axis,

magnetic means pivotally mounted about a pivot axis on pivot means fixed to said base member for rotation therewith about said rotary axis, and

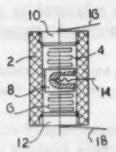
a sensing coil mounted on said base member for rotation therewith,

said magnetic means and said sensing coil being mounted for relative angular movement therebetween about said pivot axis transverse to the rotary axis of said base member and operative to generate a signal in response thereto.

4,114,453
ACCELEROMETER SENSOR

Benzion Sandler, Beersheba, Israel, assignor to Ben Gurion University of the Negev Research & Development Authority, Beersheba, Israel

Filed Jun. 13, 1977, Ser. No. 806,265
Claims priority, application Israel, Jun. 13, 1976, 49777
Int. Cl.[2] G01P *15/12*
U.S. Cl. 73– [3]17 R **10 Claims**



1. An acceleration sensor, comprising:

a housing;

an electrical resistor body disposed within the housing and including compacted interleavings of insulating sheet material carrying electrically-conductive particles imparting to said body a high electrical resistivity in the axial direction, which resistivity decreases with the further compaction of said body in the axial direction;

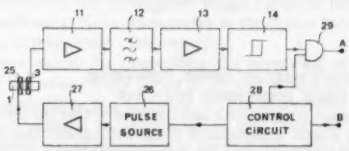
a mass movable within the housing in response to acceleration and effective to apply pressure to the resistor body in the axial direction to further compact same and thereby to decrease its axial resistivity;

and electrical contacts connected to the opposite ends of said resistor body to enable the axial resistivity thereof to be measured.

4,114,454
METHOD OF MEASURING THE RESONANCE FREQUENCY OF MECHANICAL RESONATORS

Herbert Ernyei, and Etienne Langlois, both of Paris, France, assignors to Societe Telegraphiques et Telephoniques, Paris, France

Filed Jun. 27, 1977, Ser. No. 810,405
Claims priority, application France, Jun. 29, 1976, 76 19676; Apr. 25, 1977, 77 12409
Int. Cl.[2] G01M *7/00*
U.S. Cl. 73—579 **9 Claims**



1. A method of measuring the resonant frequency of a mechanical resonator oscillating in a given mode, the steps comprising:

positioning the resonator within a solenoid;

establishing a magnetic field along the axis of said solenoid;

shock exciting said resonator into oscillation in the desired mode at an initial time to induce a voltage in said solenoid

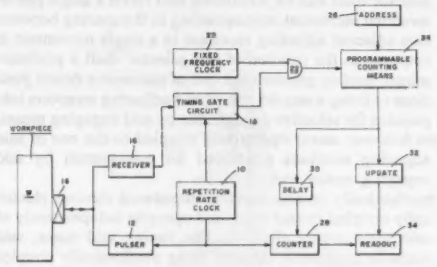
having a component, the frequency of which is proportional to the resonant frequency of the resonator; and

amplifying, filtering, and shaping said induced voltage to energize a visual display of the resonant frequency of the resonator under test.

4,114,455
ULTRASONIC VELOCITY MEASURING METHOD AND APPARATUS

Philip A. Walker, Trumbull, Conn., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,592
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—597 **22 Claims**



1. An apparatus for measuring the acoustic velocity of a workpiece which includes means for providing trigger pulses, circuit means for transmitting responsive to said trigger pulses an ultrasonic search pulse into the workpiece and subsequently receiving an echo pulse responsive to the transmitting of the search pulse and such search pulse intercepting an acoustic impedance change, means coupled to said circuit means for providing counts commensurate with the transit time of the search pulse traversing the workpiece dimension as determined by a first signal responsive to the transmitting of said search pulse and a second signal responsive to the receipt of the echo pulse, the improvement comprising:

first counting means coupled to said means coupled to said circuit means for counting and accumulating said counts until a predetermined quantity of counts, which quantity is commensurate with the thickness of the workpiece, is accumulated and providing an output signal when such accumulated count is obtained, and

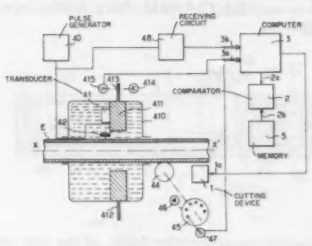
second counting means coupled for receiving said trigger pulses and said output signal and counting the quantity of trigger pulses and providing a signal commensurate with the acoustic velocity of the workpiece responsive to receipt of said output signal.

4,114,456
ULTRASONIC DEVICE FOR CUTTING SECTIONS OF CONSTANT WEIGHT FROM A TUBULAR BLANK

Jacques Dory, Meaux, France, assignor to CGR Ultrasonic, France

Filed May 19, 1977, Ser. No. 798,550
Claims priority, application France, May 21, 1976, 76 15376
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—622 **4 Claims**

1. An apparatus for the accurate determination of the increase in volume of a longitudinally moving tubular body in relation to a straight section reference plane, said apparatus comprising a single transducer adjusted to emit and receive ultrasonic pulses along a path directed towards the axis of the tubular body, means for exciting this transducer at a specific pulse period, means for rotating the transducer around the axis of the tubular body at a specific rotation period, a reflector integral with the rotation of the transducer and adjusted partly to reflect the ultrasonic pulses on said path, means for generating digital signals representing the relative angular position and longitudinal position of the tubular body and the transducer, pulse receiver circuit means connected to said transducer and calculating means connected to said means for generating digital signals and to said pulse receiver circuit means, said pulse receiver circuit means comprising means for generating first, second and third gating signals whose durations are in proportion to the propagation times of the said ultrasonic pulses from the transducer to the reflector and to the outer and

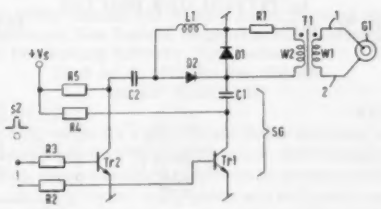


inner surfaces of the tubular body respectively and means for generating, from the said first, second and third gating signals, first and second further digital signals representing the distance from the reflector to the said outer surface and to the thickness of the tubular body, respectively; the calculating means being adapted to calculate, from the said first and second further digital signals, the elementary area of the angular portion of the straight section of the tubular body which is swept by the said path during the said pulse period and the sum of the said elementary areas during the said rotation period.

4,114,457
APPARATUS FOR ULTRASONIC MEASUREMENT

Niels Thun, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jun. 23, 1977, Ser. No. 809,172
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629562
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—632 **8 Claims**



1. An ultrasonic measurement circuit, comprising a transmission line having source and load ends and first and second conductors, an ultrasonic transducer effectively between said conductors at said load end of said line, said transducer serving as a transmitter, signal generator means in said first conductor at said source end of said line having conductive and nonconductive states, impedance matching resistance means in said second conductor at said load end of said line, one way switching means shunting said conductors between the output side of said signal generator means and the upstream side of said resistance means, said one way switching means being poled towards said resistance means, and current generating means for effecting a current through said one way switching means during said nonconductive state of said signal generator means

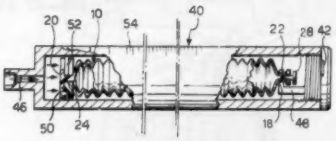
to make said impedance matching resistance means effective during said nonconductive state.

4,114,458

FLUID PRESSURE TRANSDUCER AND PRESSURE MEASURING INSTRUMENT INCLUDING THE TRANSDUCER

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed Jun. 28, 1977, Ser. No. 810,830
Claims priority, application Italy, Jul. 2, 1976, 68644 A/76
Int. Cl.[2] G01L *7/06, 7/10*
U.S. Cl. 73—729 **35 Claims**



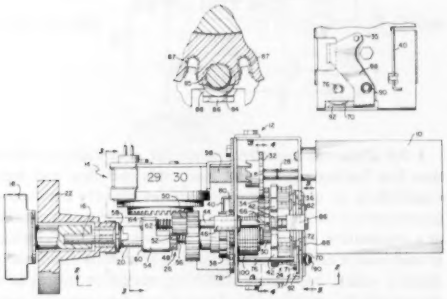
1. A pressure transducer for fluids, of the type comprising a watertight capsule which in use of the transducer is surrounded by fluid, said capsule having a peripheral bellows wall and a pair of opposite end walls, means for the attachment of one end wall to a support, an indicator device, and means for the connection of the other end wall to said indicator device, which provides an indication of changes in length of the capsule resulting from variations in the pressure of said fluid surrounding the capsule to afford an indication of said pressure, wherein the improvement consists in the capsule having a thin below wall of flexible plastics material, which capsule is partly filled with gas such as air and also contains an incompressible liquid which is substantially immiscible with said gas, the elasticity of said bellows wall being negligible compared with that of the gas contained within the capsule.

4,114,459

DETENT UHF TUNER WITH MEMORY TYPE INDEPENDENT FINE TUNING

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Division of Ser. No. 500,450, Aug. 26, 1974, Pat. No. 3,972,240. This application Apr. 21, 1976, Ser. No. 678,975
Int. Cl.[2] F16H *35/18;* **H03J** *1/02*
U.S. Cl. 74—10.41 **10 Claims**



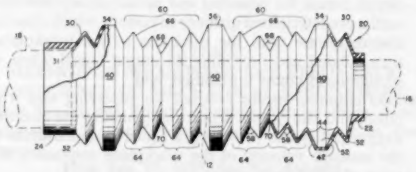
1. A tuning system including in combination:
a tuner having a continuously variable main tuning shaft, rotation of which is effective to tune said tuner over a continuous band of frequencies;
a selector shaft;
means mechanically coupled to said selector shaft for establishing a plurality of detent positions for said selector shaft;
a rotatable turret having a plurality of adjusting members mounted thereon;
a fine tuning shaft;
means responsive to said fine tuning shaft for selectively engaging and rotating a first predetermined single one of said adjusting members when said main tuning shaft is positioned in a first predetermined position;
means interconnecting said selector shaft, said main tuning shaft and said turret, said interconnecting means including means for adjusting said tuning shaft upon rotation of said selector shaft and for advancing said turret a single predetermined increment corresponding to the spacing between two adjacent adjusting members in a single movement in response to the rotation of said selector shaft a predetermined number greater than one of successive detent positions to bring a second one of said adjusting members into position for selective engagement by said engaging means;
cam follower means operatively coupled to the one of said adjusting members positioned for engagement by said engaging means; and
a mechanically tunable variable impedance element electrically coupled to said tuner and operable independently of said main tuning shaft for fine tuning said tuner, said variable impedance element being mechanically coupled to said cam follower means and adjustable by the one of said adjusting members positioned for engagement by said engaging means.

4,114,460

PROTECTIVE BOOT

Takao R. Oto, Fresno, Calif., assignor to Roto Manufacturing Co., Inc., Fresno, Calif.

Filed Feb. 24, 1977, Ser. No. 771,688
Int. Cl.[2] F16J *15/50*
U.S. Cl. 74—18.2 **2 Claims**



1. In combination with a shaft of a shock absorber, an axially collapsible boot segment having a configuration conforming to a pair of coaxially aligned, commonly dimensioned truncated cones, joined at the planes of truncation thereof, comprising:
A. at least one pair of commonly dimensioned annular convolutions of a first configuration disposed in axially spaced, coaxial alignment, each convolution of said pair being characterized by a peripheral wall of a substantially cylindrical configuration and a pair of substantially radially extended annular walls intersecting said peripheral wall and having inside diameters of a common dimension; and
B. a plurality of at least three juxtaposed annular convolutions of a second configuration interposed in juxtaposition between the pair of annular convolutions of said first configuration, each convolution of said plurality being characterized by a pair of substantially radially extended annular walls intersecting to define an acuminate periphery, the outside diameter of each convolution of the second configuration adjacently related to a convolution of said first configuration being less than the internal diame-

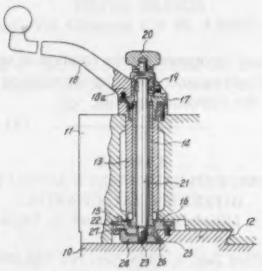
ter of the peripheral wall thereof and greater than the outside diameter of the juxtaposed convolution of the second configuration, whereby a nesting of the convolutions characterized by a lesser outside diameter within the convolutions characterized by a greater outside diameter is facilitated.

4,114,461

LEVER-OPERATED FEED DEVICE

Ikuo Otsu, Toyota, and Akiyoshi Onishi, Hazu, both of Japan, assignors to Toyoda-Koki Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,735
Claims priority, application Japan, May 27, 1976, 51-67804
Int. Cl.[2] F16H *19/04*
U.S. Cl. 74—29 **6 Claims**



1. A lever-operated feed device for moving a slide block slidably guided upon a base, comprising in combination:
- a stationary toothed member extending in the direction of the slide movement of said slide block;
- a rotational sleeve rotatably supported by said slide block;
- a rotational toothed member provided upon said rotational sleeve and meshingly engaged with said stationary toothed member for sliding said slide block when rotated;
- a lever handle provided at one end of said rotational sleeve for rotating the same together with said rotational toothed member;
- a rod extending through said rotational sleeve, being rotatable therein and being in co-axial alignment therewith;
- a clamp handle provided at one end of said rod for rotating the same; and
- means connected with said rod for clamping said slide block upon said base when said clamp handle is rotated in one direction and for unclamping said slide block therefrom when said clamp handle is rotated in the other direction.

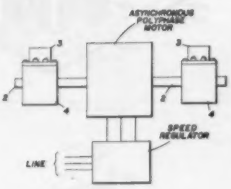
4,114,462

UNBALANCED VIBRATOR FOR AN OSCILLATING CONVEYOR OR A VIBRATING SCREEN

Klaus Jürgen Grimmer, Alpenstrasse 39, Steiermark, A-8707 Leoben-Goss, Austria

Division of Ser. No. 258,986, Jun. 2, 1972, Pat. No. 3,822,604. This application May 24, 1974, Ser. No. 473,061
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—61 **7 Claims**

1. A vibratory power unit for use on AC current, in which the vibratory action may be controlled solely by adjustment of the applied AC voltage over a limited range, particularly for use as a power unit for vibrating conveyors, and screens, comprising an asynchronous polyphase motor having a useable speed range, in dependence upon applied voltage, of from normal design rated maximum speed at normal supply voltage to a minimum useable speed of approximately 80% thereof, at an intermediate reduced voltage, at least one centrifugal assembly, disposed on the shaft of said motor, comprising a pair of cooperable masses, the first mass of which is rigidly fastened to said shaft, and the other of which is mounted for radial movement outwardly from an inner operative position, at which the assembly has a minimum unbalance, to an outer operative position of maximum unbalance, at which maximum vibratory action is produced, and spring means biasing said second mass in a direction toward said inner position, said spring means having such physical and operating parameters, and being so prestressed that the pressure applied to said second mass is greater than centrifugal forces on said mass opposing said spring pressure, at motor speeds below said minimum useable speed, and thus operative to maintain said mass in its inner position until such minimum speed is exceeded, but is insufficient to restrict outward movement of said mass to said outer



operative position at maximum motor speed, whereby as the motor speed is progressively increased from said minimum to said maximum said second mass will progressively move outward in respective relative positions in correspondence to the instant motor speed, whereby the vibratory forces producible by said mass may be progressively increased from an operative minimum condition to an operative maximum condition, merely by adjustment of the motor supply voltage within said relatively limited range varying the rotational motor speed from said minimum value to said maximum value, operative to provide a control of such conveyor or screen operation over the normal operational range of the latter.

4,114,463

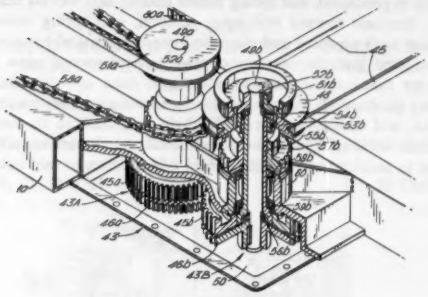
DRIVE MEANS AND HARVESTING APPARATUS INCORPORATING SAME

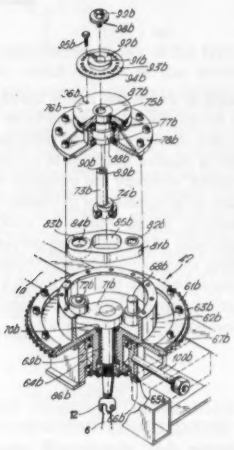
Graham Miller Garden, and Richard James Harwood, both of Christchurch, New Zealand, assignors to New Zealand Inventions Development Authority, New Zealand

Filed Jul. 9, 1975, Ser. No. 594,566
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—61 **6 Claims**

1. A drive means for a pair of tined shaker members, which comprises a single high speed prime mover; two vibrating head assemblies; means effecting a synchronized driving connection between said high speed prime mover and an input of each of said vibrating head assemblies to transmit a synchronised high speed rotation from said prime mover to said inputs but in contra-rotation one to the other; and in which said assemblies each include a housing rotatably mounted in a casing, an input member rotatably mounted in said housing, an output member rotatably mounted in each housing and in driving connection with one of said shaker members and linked to the housing for rotary movement therewith, and means between said input and output member producing a high speed torsional or rotary vibration in said output member; and in which said housings are linked for synchronised rotational movement in opposed rotary directions, the arrangement being such that a synchronised rotary motion be effected by said output members in opposed directions together with said torsional or rotary vibration produced in synchronisation in said output members in the same rotary direction such that opposed tines provided on the

shaker members and which engage in an object passing therebetween as the shaker members rotate in contra-rotation simul-





taneously effect a shake of maximum intensity on opposed sides of said object.

4,114,464

ARTIFICIAL HAND AND DRIVE APPARATUS FOR SUCH HAND

Klaus-Peter Schubert, Feldkirchen; Hartmut Keller, Weyarn, and Jürgen J. Hildebrandt, Brunnthal, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

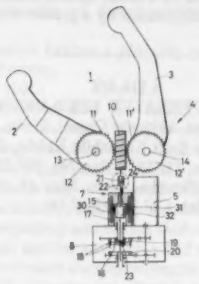
Filed Feb. 11, 1977, Ser. No. 767,678

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607499

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.14 **9 Claims**

1. An artificial hand comprising frame means constituting the hand proper, a thumb, first journal means operatively connecting the thumb to said frame means, finger means, second journal means operatively connecting said finger means to said frame means, first gear means secured to said thumb for rotating the thumb about the first journal means, second gear means secured to said finger means for rotating the finger means about said second journal means, said thumb and finger means being arranged opposite each other to form gripping tongues, worm gear means operatively interposed between said first and second gear means in such a position that both gear means mesh with said worm gear means simultaneously, motor means secured to said frame means, and reversible gear drive means supported by said frame means and operatively interposed between said worm gear means and said motor means for rotating said worm gear means, whereby said grip-



ping tongues may be opened by the rotation of said worm gear means in one direction and closed by the rotation of said worm gear means in the opposite direction.

4,114,465

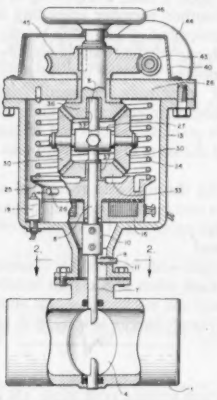
MODULATING FAILSAFE VALVE ACTUATOR USING DIFFERENTIAL GEARING

M. Frank Troy, Hinsdale, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Dec. 6, 1976, Ser. No. 749,195

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.17 **13 Claims**



1. A valve actuator comprising;

a reversible drive motor;

means multiplying motor torque;

a housing having upper and lower ends;

a differential drive unit in said housing, having an input and output, and intermediate gears rotating on a shaft, said input connected to said multiplier;

a valve operating shaft rotatably contained in said input and output gears, and fixed to said intermediate gear shaft;

a helical coil spring in said housing having first and second ends, said first spring end fixed in said housing upper end;

a spring retainer in said housing fixed to said spring lower end and said differential output;

means signaling position of said retainer relative said housing and reversing said motor;

an electromagnetic clutch responsive to said signal means, in said housing, intermediate said retainer and housing lower end, and adjacent said operating shaft, for releasably limit-

ing motion relative said operating shaft and spring retainer;

a stop, for selectively limiting rotation of said operating shaft relative said housing;

wherein said drive motor and torque multipler rotate said retainer through said differential drive, said rotation relative said retainer and housing, compressing said spring; and,

after a predetermined amount of rotation, actuating said clutch, and reversing said motor, providing normal valve operation;

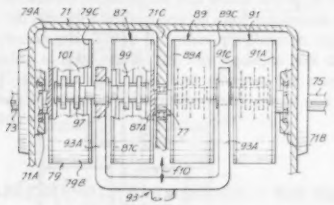
whereby loss of clutch power and drive torque will return said shaft to said stop.

4,114,466

SPEED CONVERTORS FOR PROVIDING VARIABLE DRIVE RATIOS

Amleto Meucci, Via Giuseppe Cei 99, I-56021 Cascina, Pisa, Italy

Continuation of Ser. No. 537,712, Dec. 31, 1974, abandoned.
This application Jan. 6, 1977, Ser. No. 757,141
Int. Cl.[2] F16H *29/04*
U.S. Cl. 74—117 **5 Claims**



1. A first group of shafts including an input and an output shaft, all of said first group of shafts having parallel rotational axes that are fixed with respect to each other;

a plurality of first rotary bodies having toothed rims, each of said first rotary bodies being attached to, and rotatable about an axis defined by one of said first group of shafts;

first support means connecting said first group of shafts;

a second group of shafts;

a plurality of second rotary bodies, each of said second rotary bodies being attached to, and rotatable about an axis defined by one of said second group of shafts, each of said plurality of second rotary bodies being arranged within one of said first plurality of rotary bodies to form one of a plurality of drive units;

second support means connecting said second group of shafts;

a plurality of oscillatory arms mounted on each of said second bodies, each of said oscillatory arms having a first end attached to said second body and a free end, said free ends of the oscillatory arms being at different distances from the second shaft which is attached to said second body;

unidirectional means attached to the free ends of each of said oscillatory arms, said unidirectional means cooperating with the toothed rim of said first rotational body of each drive unit during a predetermined portion of each rotation of said second body to effect drive transmission between said first and second bodies of each drive unit;

first means, including said plurality of oscillatory arms, which are operative to vary the distance between said first and second shafts of each drive unit to obtain a variable eccentricity of the first and second rotational bodies of each drive unit, which eccentricity determines the drive ratio of each drive unit; and

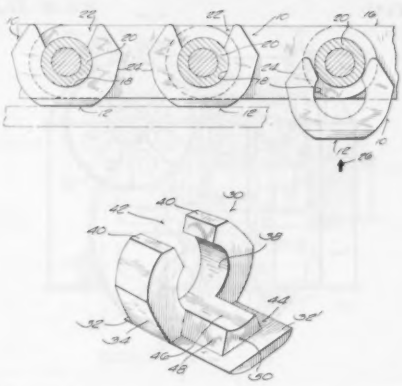
second means to move one of said first and second support means relative to the other to vary the eccentricity of said second group of shafts with respect to said first group of shafts and thereby vary the drive ratio of all of said plurality of drive units.

4,114,467

SNAP-ON WEAR PAD

Victor D. Petershack, Elm Grove, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 2, 1976, Ser. No. 746,762
Int. Cl.[2] F16G *13/02, 15/00*
U.S. Cl. 74—255 R **12 Claims**



1. A snap-on wear pad adapted to be used on a conveyor chain, said wear pad:

(a) having a main body portion which is in axial length approximately equal to the distance between the side bars of the conveyor chain on which the wear pad is to be used;

(b) having an axial hole clear through the main body portion which is more than semi-circular but less than circular in cross-section and which is sized and shaped to fit snugly around a chain bushing, roller, or pin of the conveyor chain on which the wear pad is to be used;

(c) having an at least generally radial entrance slot which leads from the outer surface of the main body portion of the wear pad to the axial through hole, which extends the axial length of the main body portion, and which is somewhat less wide than the diameter of the chain bushing, roller, or pin which is to fit into the axial hole;

(d) having a tab portion connected to the main body portion opposite to the entrance slot and extending axially outwardly therefrom at a distance beneath the center line of the axial hole not more than the thickness of the side bar, whereby the tab portion prevents the wear pad from rotating about the chain bushing, roller, or pin;

(e) being resilient about a plane passing through the entrance slot and the tab portion, whereby the wear pad can be forced onto and releasably held on the chain bushing, roller, or pin; and

(f) being wear-resistant on the side opposite to the entrance slot, whereby the portion extending beyond the side bars of the chain during use acts as a wear surface.

2. A snap-on wear pad as recited in claim **1** wherein at least a portion of the radial surface of the wear pad is shaped to engage the teeth of a sprocket over which the conveyor chain is passed.

3. A snap-on wear pad as recited in claim **1**, wherein the entrance slot is flared outwardly to facilitate snapping the wear pad onto the chain bushing, roller, or pin.

4. A snap-on wear pad as recited in claim **1** which is made from a single piece of plastic.

5. A snap-on wear pad as recited in claim **1** which comprises

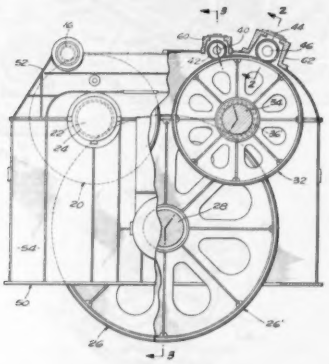
two such tabs, one of which projects from each axial side of the main body portion.

4,114,468

DRIVE MEANS FOR ELECTRIC GENERATORS PARTICULARLY ADAPTED IN FLOATING POWER PLANT

Theodore Carpentier, Los Angeles, Calif., assignor to Universal Power Corporation, Fresno, Calif.

Continuation of Ser. No. 333,288, Feb. 16, 1973, abandoned.
This application Jun. 23, 1976, Ser. No. 698,822
Int. Cl.[2] F16H *57/00*
U.S. Cl. 74—410 **6 Claims**



1. A gear train assembly for interconnecting the shaft of a prime mover in driving relationship with a second shaft, comprising:

a bull gear, said bull gear being relatively large and massive with respect to all other gears in said gear train assembly;

first gear means connecting said prime mover shaft in driving relationship with said bull gear, said first gear means being a speed reducer operable to drive said bull gear at a rate of rotation lower than the rate of rotation of said prime mover shaft; and

second gear means connecting said bull gear in driving relationship with said second shaft, said second gear means being a speed increaser operable to drive said second shaft at a rate of rotation higher than the rate of rotation of said bull gear, said bull gear having substantially greater inertia than the other gears sufficient to operate as a flywheel to stabilize the speed and to have the capability of providing torsional vibration damping to isolate such vibration from the second shaft,

said prime mover shaft is the output shaft of a steam turbine;

said bull gear is a ship's bull gear of the type used in driving a ship's propeller; and

said second shaft is the input shaft of a generator, having a stabilized output frequency.

4,114,469

VALVE ACTUATOR

Andrew Stratienko, Philadelphia, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,386
Int. Cl.[2] F16H *1/16*
U.S. Cl. 74—424.8 VA **13 Claims**

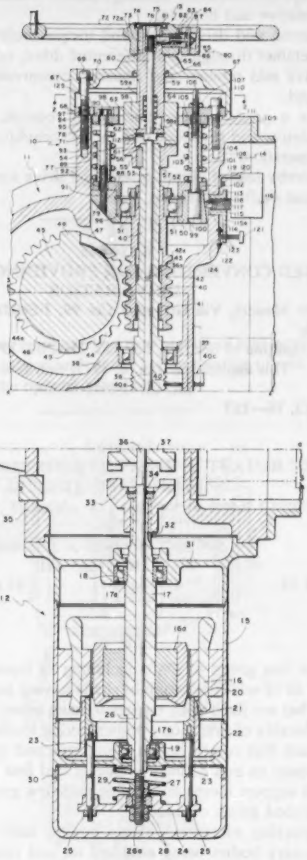
1. Valve actuator means comprising:

primary drive means;

worm gear means operably connected to said drive means by first disconnectable means;

manual operator means operably connectable to said worm gear means by second disconnectable means; and,

means longitudinally movably mounted within said worm gear means and operably engageable with said first disconnectable means and said second disconnectable means



for preventing simultaneous engagement of said first and second disconnectable means.

4,114,470

RELATING TO PRESSURE FLUID OPERATED ACTUATORS

Charles William Scott Sharpe, Inchtue, Great Britain, assignor to Perenco Limited, Perth, Great Britain

Filed Jan. 14, 1977, Ser. No. 759,537
Claims priority, application United Kingdom, Jan. 16, 1976, 1677/76
Int. Cl.[2] G01H *9/00*
U.S. Cl. 74—441 **6 Claims**

1. A rotary actuator comprising

an enclosure having an internal rectilineal slideway along which a slide member is movable, said slide member being formed by a hollow body extending longitudinally of the slideway,

first means for moving the slide member along the slideway, second means restraining the slide member from rotating during movement along the slideway,

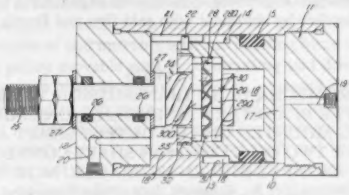
a shaft extending into the enclosure and being rotatable relative to the enclosure, the shaft axis extending longitudinally of the slideway,

a worm screw carried within the enclosure by the shaft and a screw-threaded nut assembly carried by said slide mem-

ber, said nut assembly and worm screw being arranged mutually to interact so that the shaft rotates when the slide member moves along the slideway, and wherein

said second means comprising one of the slide member body and enclosure wall including a protrusion projecting therefrom and the other including a groove extending longitudinally relative to the slideway for receiving and cooperating with the protrusion,

said nut assembly is releasably mounted within said hollow



body, means for constraining the nut assembly against rotational movement,

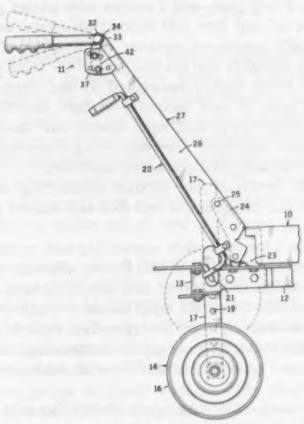
said nut assembly comprising first and second nut elements each threadedly mounted on said worm screw, at least one of the nut elements having limited axial movement relative to the worm gear and to the other nut element, and means for urging at least one of the nut elements in a direction axially opposite the other nut element for minimizing rotational backlash between the worm screw and the nut assembly.

4,114,471

ADJUSTABLE HANDLE BAR ASSEMBLY FOR ROTARY TILLER

Kenneth W. White, Bridgeton, Mo., assignor to Atlas Tool & Manufacturing Co., St. Louis, Mo.

Filed Nov. 8, 1976, Ser. No. 739,707
Int. Cl.[2] B62K *21/16*
U.S. Cl. 74—551.6 **7 Claims**



1. An adjustable handle bar assembly for an implement, comprising:

(a) a handle panel including a web and side flanges, the panel web having a curvilinear end, and the side flanges having recesses adjacent the curvilinear panel web end, to provide a handle bar socket,

(b) a handle bar rotatively mounted in the handle bar socket and extending laterally beyond the side flanges, and

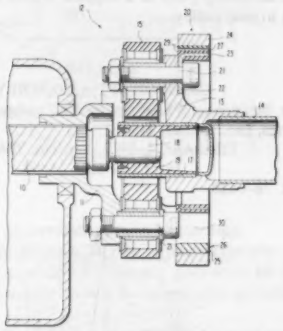
(c) an adjustable connection between the handle bar and side flanges to adjust selectively the angular disposition of the handle bar in its socket.

4,114,472

INSTALLATION FOR VIBRATION DAMPING IN DRIVE CONNECTION OF MOTOR VEHICLES

Rudolf Hörnig, Esslingen; Bruno Beeskow, Bietigheim, and Günter Wörner, Rommelshausen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jul. 30, 1976, Ser. No. 710,160
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1975, 2534684
Int. Cl.[2] F16D *13/78, 3/58*
U.S. Cl. 74—574 **21 Claims**



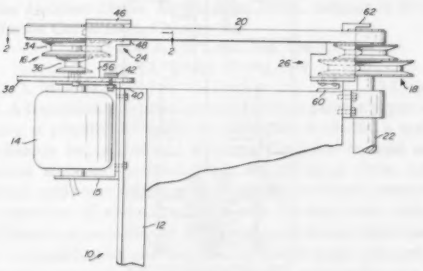
1. An installation for damping vibrations in a drive connection of vehicles with the aid of a vibration absorber means whose absorber mass is constructed as an annular member, the absorber mass being connected by way of elastic means with a driving part of the drive connection consisting at least of a transmission means having an output shaft and of a universal joint shaft means having an input, characterized in that the connection between the transmission output shaft and the universal joint shaft means comprises an elastic coupling means which is sufficiently radially yielding to effect a separation of the vibrational system of the drive connection, and in that the vibration absorber means is coordinated to the universal joint shaft input.

4,114,473

GUARD FOR BELT PULLEY

Henry M. Pollak, 823 Brookside Rd., Pottstown, Pa. 19464

Filed Dec. 1, 1976, Ser. No. 746,366
Int. Cl.[2] F16P *1/00*
U.S. Cl. 74—611 **4 Claims**



1. A pulley guard mounted within an endless belt adjacent a pulley which has three grooves each of a different diameter, the guard including a top wall for overlying a portion of the pulley side face between the nips of said belt and said pulley, a

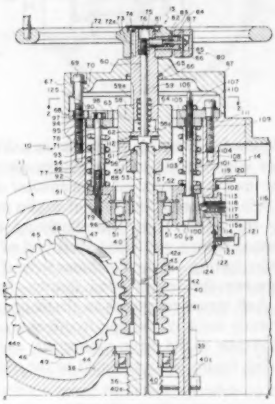
side wall connected to said top wall and extending generally at right angles therefrom, said guard having three projections on said side wall with each projection terminating in an arcuate end face juxtaposed to the inner diameter of one of said pulley grooves, each arcuate end face on said projections having a center of curvature corresponding to the axis of rotation of said pulley, mounting means connected to one of said walls for mounting said walls in a position so that each of said projections enters one of said pulley grooves and one projection occupies substantially all its pulley groove which is unoccupied by the belt, said mounting means including a mounting plate having a hole for accomodating the drive shaft of a motor, said drive shaft being connected to said pulley, and an adjustable clamp associated with said mounting plate for securing the mounting plate to a support which is stationary with respect to said pulley.

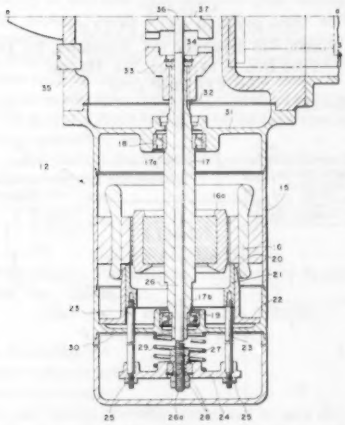
4,114,474

GEAR SHAFT ASSEMBLY

Andrew Stratienko, Philadelphia, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,387
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—625 **5 Claims**





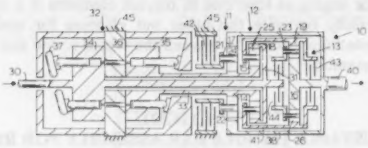
1. A motorized gear-drive assembly comprising:
motor means comprising an electric motor having an output shaft;
a first clutch slidably located on said output shaft near the end thereof;
a hollow gear-drive shaft coaxially aligned with said output shaft and having a second clutch engageable with said first clutch, and a third clutch at the opposite end thereof;
manual operating means having an output shaft coaxially aligned with said gear-drive shaft and having a fourth clutch slidable on said manual output shaft engageable with said third clutch; and,
sliding rod means passing through said hollow shaft and arranged to prevent simultaneous engagement of said four clutches by abutment with said first and fourth clutches.

4,114,475

HYDROMECHANICAL TRANSMISSION WITH THREE SIMPLE PLANETARY ASSEMBLIES, ONE SUN GEAR BEING MOUNTED ON THE OUTPUT SHAFT AND THE OTHER TWO ON A COMMON SHAFT CONNECTED TO AN INPUT-DRIVEN HYDRAULIC MODULE

Elias Orshansky, Jr., deceased, late of San Francisco, Calif. (by Betty Bacon Orshansky, executrix), and William E. Weseloh, San Diego, Calif., assignors to Orshansky Transmission Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,766
Int. Cl.[2] F16H *47/04, 37/06, 47/00, 51/10*
U.S. Cl. 74—687 **6 Claims**



1. A power transmission comprising:
a stationary frame,
input means,
output means,
first, second, and third planetary assemblies each having a sun gear, a ring gear, and a carrier with planet gears, the sun gears of said first and second planetary assemblies, being rigidly connected together, the ring gear of said first planetary assembly and the sun gear of the third planetary assembly being rigidly connected to said output means, the ring gear of said second planetary assembly being rigidly connected to said input means, and the carrier of said second planetary assembly being connected to the ring gear of said third planetary assembly,
a reversible speed-varying module connecting said input means to said sun gears of said first and second planetary assemblies,
braking means for releasably connecting said carrier of said first planetary assembly to said frame, whereby when said braking means is engaged, said output means is driven hydrostatically from said input means through said speed-varying module and said first planetary assembly,
first releasable clutching means for connecting said carrier of said third planetary assembly with said input means, and
second releasable clutching means connecting said ring gear of said third planetary assembly to said output means.

4,114,476

AUTOMATIC TORQUE STICK TRANSMISSION

Anthony W. Fini, Jr., 4273 Mundy St., Blasdell, N.Y. 14219

Filed Jul. 15, 1976, Ser. No. 705,395
Int. Cl.[2] F16H *3/02;* B60K *1/00, 9/00*
U.S. Cl. 74—745 **4 Claims**

1. A variable speed transmission system, comprising:
a manually shiftable gear box having a plurality of synchro-

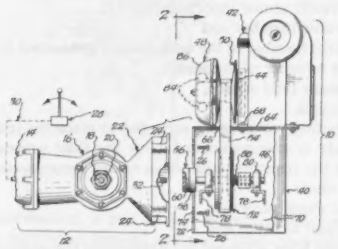
nized forward speed gear ratios, said gear box having an input shaft;

an overrunning clutch mounted on said input shaft for disengaging said input shaft from a vehicle engine upon deceleration of such vehicle engine;

a second shaft connected to said overrunning clutch;

a torque converter connecting said second shaft to a drive shaft of a vehicle engine, said torque converter including a drive pulley mounted on such vehicle engine drive shaft to be driven thereby and having a movable wall which moves to contract and open said drive pulley and centrifugal weights connected to said movable wall controlling movement of said movable wall and exerting force on said drive pulley movable wall for contracting said drive pulley as such vehicle engine speed is increased from an idling speed to maximum engine speed, said torque converter further including a driven pulley mounted on said second shaft for driving said second shaft and having a movable wall which moves to contract and open said driven pulley, and a spring mounted on said second shaft and connected to said driven pulley movable wall, said spring biasing said driven pulley movable wall in a direction to contract said driven pulley, and a V-belt connecting said drive and driven pulleys, said pulleys having walls shaped to correspond to the shape of said V-belt;

said V-belt being mounted in said driving and driven pulleys to be selectively engaged by said drive pulley and so force



said driven pulley into an open configuration against said spring bias as said drive pulley is contracted by said weights as such vehicle engine speed is increased from idling speed, said spring bias being matched to the force exerted on said drive pulley movable wall by said weights so that said drive pulley and said driven pulley movable walls move synchronously and so that the drive pulley is fully contracted and said driven pulley is fully open at maximum engine speed, and vice versa at engine idling speed;

said overrunning clutch being interposed between said gear box input shaft and said second shaft so that at each gear change upon deceleration of such vehicle engine, said second shaft is disengaged from said gear box input shaft with said weights relaxing the force exerted on said drive pulley movable wall and said spring bias moving said driven pulley movable wall to fully close said driven pulley, said belt forcing said drive pulley fully open whereby after each gear change said drive pulley is fully open and said driven pulley is fully contracted so that torque transmitted to said gear box from an engine via said torque converter is maximized, said pulley movable walls moving synchronously as such engine accelerates and decelerates with said drive pulley being fully open when said driven pulley is fully contracted and vice versa whereby full use is made of available torque output from a vehicle engine in each forward speed gear of said gear box.

4,114,477

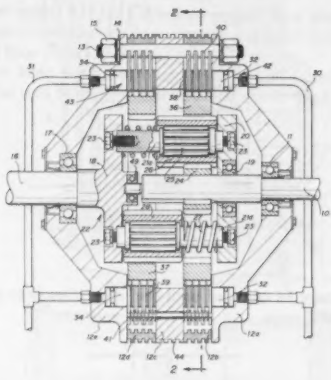
REVERSIBLE POWER TRANSMISSION

Roger A. Iverson, 8469 Everett Way "A", Arvada, Colo. 80005

Filed Oct. 18, 1976, Ser. No. 733,480

Int. Cl.[2] F16H *57/10*; F16D *7/02*

U.S. Cl. 74—768 **10 Claims**



1. A reversible power transmission comprising:

(a) a cylindrical housing having a pair of axially spaced brakes each including a set of stator disks and a set of rotor disks with hydraulic means for selectively actuating said brakes,

(b) two ring gears each having gear teeth on inner and outer surfaces thereof with the outer teeth enmeshed with inner teeth on said rotor disks,

(c) an axial input shaft extending into one side of said housing carrying a driving sun gear,

(d) an output shaft aligned with said input shaft extending from said housing on the other side thereof,

(e) a cage carried by said output shaft, and

(f) two arrays of idler pinion gears journaled in said cage with a first of said arrays driven by said sun gear and driving the second of said arrays and with each pinion of said first of said arrays enmeshed with teeth on the inside of one of said ring gears and with each pinion of the second of said arrays enmeshed with teeth on the inside of the other of said ring gears.

4,114,478

PLANETARY TRANSMISSION MECHANISM

Julius Alphonse Clauss, Birmingham, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

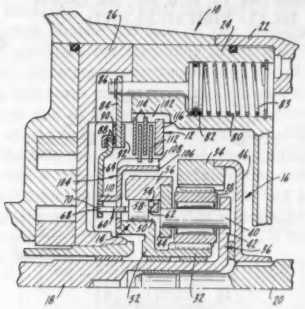
Filed Jan. 3, 1977, Ser. No. 756,316

Int. Cl.[2] F16H *57/10, 3/44*

U.S. Cl. 74—781 R **5 Claims**

1. A transmission mechanism comprising a planetary gear set having a plurality of relatively rotatable elements, a brake mechanism for one of said elements engagable to hold said element stationary and establish a high-speed drive ratio through said transmission, a roller clutch mechanism mounted between two of said elements, a cage for said roller clutch mechanism, a controller for said cage comprising a plate member engageable with said cage and operative when actuated to hold said cage wherein no direct driving relationship can be established between said two elements in one direction of relative rotation and having a position in which said cage is released whereby a two-way one-to-one drive through said gear set is established by said roller clutch when said cage and

said brake are released, a piston for said brake mechanism, and said controller being connected to said piston whereby said



brake cannot be engaged until said controller is in a position holding said cage.

4,114,479

EPICYCLIC GEARING

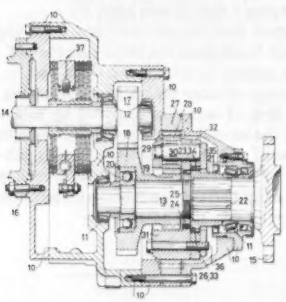
Herbert Edward Ashfield, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England

Filed Jun. 20, 1977, Ser. No. 807,855

Claims priority, application United Kingdom, Jun. 24, 1976, 26301/76

Int. Cl.² F16H *1/28*

U.S. Cl. 74—801 **8 Claims**



1. Epicyclic gearing comprising a sun gear journalled on a shaft; a sleeve rigidly secured on the shaft and having a ring of external gear teeth; a lock-nut, for the sleeve, which engages with a screw thread formed on the shaft and has a ring of external gear teeth; an annular gear fixed against rotation; a plurality of planet pinions driveably interconnecting said sun gear and said annular gear; and a floating planet carrier driveably connected to the sleeve and comprising an annular body in which there are disposed spindles on which the respective planet pinions are journalled, the body having a ring of internal gear teeth which mesh with the teeth on the lock-nut with substantial backlash, an annular back-plate whose internal diameter is less than the tip diameter of the teeth on the sleeve, an annular disc having a ring of internal gear teeth whose tip diameter is greater than the tip diameter of the teeth on the lock-nut and which mesh with the teeth on the sleeve with substantial backlash, and means for clamping the disc between the body and the back-plate, the teeth on the sleeve being of such axial length that they fit with axial clearance between the body and the back-plate.

4,114,480

CONTROL DEVICES FOR TRANSMISSIONS OF AUTOMOTIVE VEHICLE ENGINES

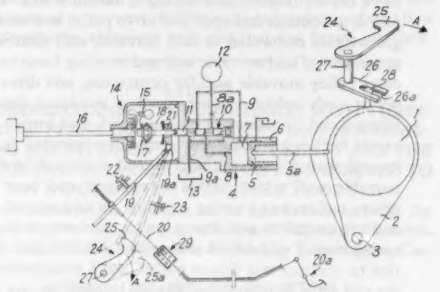
André Estaque, Bagneux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jan. 12, 1977, Ser. No. 758,771

Claims priority, application France, Jan. 13, 1976, 76 00710

Int. Cl.² B60K *41/18*

U.S. Cl. 74—865 **4 Claims**



1. In a change-speed transmission for an automotive vehicle engine,

means for controlling the operation of the transmission, including

a hydraulic sensor incorporating

a movable member and

a control member of the transmission connected to the movable member of the sensor,

a pressure fluid source,

a reservoir,

distributing valve means arranged to place the sensor selectively in communication with the fluid pressure source and the reservoir, said valve means incorporating

slide means

a centrifugal governor,

a resilient member and

a pivotal lever arranged to interconnect the resilient member and an accelerator control member of the automotive vehicle, the slide means being connected to the centrifugal governor and to the resilient member so that the forces exerted are opposed to one another, and

a movable abutment connected to the control member of the transmission and disposed opposite the pivotal lever to limit its pivotal motion due to the acceleration control member to a value which varies as a function of the position of the control member of the transmission.

4,114,481

OIL FILTER WRENCH WITH RATCHET DRIVE

Adolph J. Kowalczyk, Minneapolis, Minn., assignor to J-Mark Quality Products, Inc., Minneapolis, Minn.

Filed Jul. 22, 1977, Ser. No. 817,930

Int. Cl.² B25B *13/52*

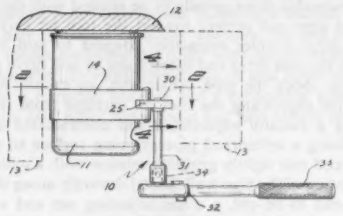
U.S. Cl. 81—64 **4 Claims**

1. An oil filter wrench to be driven by the detented drive lug of a ratchet wrench, comprising

a looped band to embrace an oil filter and having lapped and proximate ends on adjacent pivots, one end being spaced outwardly of the other end, and

a drive fitting connecting and retaining said pivots together and swingable relative to both ends of the band to draw the band together in close fitting and gripping relation on the filter, the drive fitting including a pair of rigid connector panels confronting each other in spaced relation and both lying normal to the pivot axes, the connector panels having aligned socket openings to receive the drive lug of

a ratchet wrench and retain the detent of the lug in the space between the panels to thereby maintain the fitting



on the lug while resisting movement of the fitting endwise along the lug, and the connector panels also having means maintaining the panels in spaced relation to each other.

4,114,482

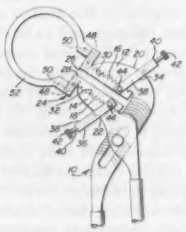
MULTIPLE USE ADAPTERS FOR PLIERS

Donald D. Houdeshell, RR #2, Republic, Ohio 44867

Filed Jun. 27, 1977, Ser. No. 810,386

Int. Cl.[2] B25B *7/02*

U.S. Cl. 81—421 **7 Claims**



1. In combination, a pair of jaw members relatively supported for movement toward and away from each other and including opposing serrated clamping surfaces and remote oppositely facing surfaces, a pair of jaw adapter members having serrated remote faces, said adapter members being removably abutted against said clamping surfaces with the serrations thereof meshed with the serrations of said remote faces, a pair of bail members each including a pair of generally parallel legs having first and second pairs of corresponding ends and a bight portion extending between and interconnecting said first pair of corresponding ends, the second pair of ends of each bail member embracingly receiving a corresponding adapter member therebetween and being pivotally anchored thereto for angular displacement about an axis extending between said second pair of ends, said legs also receiving the corresponding jaw member therebetween and each of said bight portions including a set screw threadedly secured therethrough and clamped against the corresponding surface of said remote surfaces, each of said adapter members having a work engaging member engaged therewith.

4,114,483

PORTABLE BORING TOOL FOR BALL VALVES

Ernest E. Grimsley, 4533 Wake Forest Dr., Portsmouth, Va. 23703

Filed Apr. 8, 1977, Ser. No. 785,996

Int. Cl.[2] B23B *41/00*

U.S. Cl. 82—1.2 **13 Claims**

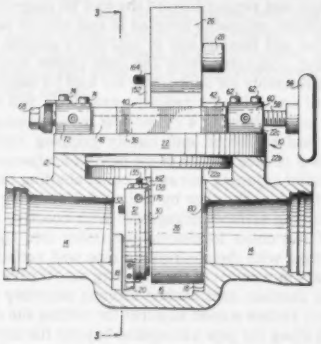
1. A boring tool for boring and the seating surface for a seal ring in a ball valve, said ball valve having a planar top surface surrounding an opening into a valve chamber, and a seating surface for a seal ring in said chamber disposed in a plane that intersects the plane of said top surface at an angle less than 90°, said boring tool comprising:

a base plate having a bottom surface adapted to mate with the planar top surface of a valve, said base plate having an opening therein which communicates with the chamber of a valve on which it is mounted;

support means movably mounted on said base plate;

an input drive shaft supported by said support means above said base plate;

a cutter head drive shaft supported by said support means below said base plate whereby said cutter head assembly



drive shaft is located in the valve chamber when the base plate is mounted on the top planar surface of a valve;

means supported by said support means for transmitting rotary motion from said input drive shaft to said cutter head assembly drive shaft;

a cutter head assembly mounted on said cutter head drive shaft and including a tool bit rotating in a circular path about an axis other than its own, said axis being normal to the seal ring seating surface; and,

means for linearly moving said support means and said tool bit along an axis which is normal to the plane of the seal ring seating surface.

4,114,484

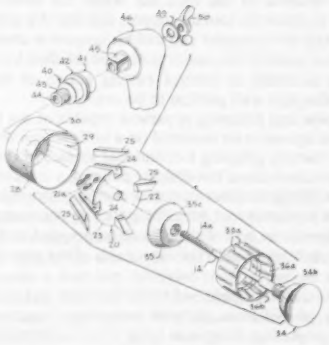
PIPE CUTTING OR END PREPPING APPARATUS

William C. Feamster, III, 4013 Nina Dr., Chesapeake, Va. 23321

Filed Nov. 16, 1976, Ser. No. 742,354

Int. Cl.[2] B23B *5/16*

U.S. Cl. 82—4 C **15 Claims**



1. A pipe cutting or end prepping apparatus capable of use in severely restricted spaces to be mounted on a stationary hollow pipe in supported relation thereby gripping a cylindrical surface of the pipe and cut through or shape for welding a hollow cylindrical wall of the pipe at a cutting site along the

pipe, comprising a rotatable tool bit support to be positioned immediately adjacent an end of the pipe to be cut and located in concentric relation with the center axis of the pipe to advance a cutting bit through adjacent portions of the pipe wall, the tool bit support having a front working end and a rear drive end spaced from the front end and having a tool bit carried by the tool bit support adjacent the working end in a predetermined cutting attitude directed outwardly relative to the pipe axis to position a cutting tip thereof to engage and cut into the pipe wall at the cutting site, a drive motor for the tool bit support to be located outwardly adjacent the pipe end and having a rotatable drive spindle to be aligned with the pipe center axis and project toward the tool bit support, a rotatable drive coupler releasably coupled to said tool bit support at the rear drive end thereof and to said drive spindle for rotation about and concentric with the pipe center axis, an anchor forming assembly for supporting the tool bit support from the pipe wall comprising a radially expandable and contractable annular collet defining a cylindrical pipe gripping surface to engage and be forced into tightly gripping relation with a cylindrical surface portion of the pipe wall adjacent the cutting site, a collet adjusting nut and a collet abutting member intercoupled with each other by a threaded coupling and having collet-forcing surfaces engageable with coactive surface portions of the collet to deform the collet into tight gripping engagement with the confronting pipe wall surface upon relative rotary movement of the adjusting nut relative to the collet abutting member, said anchor forming assembly providing a stationary anchor station adjacent the cutting site disposed at a location along the pipe axis spaced beyond the cutting site in a forward direction opposite the direction of the drive coupler from the cutting site, and a feed control assembly coupled to said anchor forming assembly having a manually adjustable threaded member and including means for supplying advancing force to said drive coupler and tool bit support for pulling the drive coupler and tool bit support at a precisely controlled feed rate toward the anchor station to advance the cutting tip into the pipe wall portion to be cut in predetermined relation to rotation of the threaded member of the feed control assembly for precisely controlling the depth and speed of cut made by the tool bit, said tool bit support and said drive spindle and drive coupler having center apertures aligned along the center axis of the tool bit support, and said collet abutting member having a rigid feed-guide rod fixed thereto and projecting therefrom through the collet and through said aligned center apertures for guiding the drive coupler and tool bit support therealong and having a threaded portion extending rearwardly beyond the drive spindle, and said manually adjustable threaded member being a feed nut threaded onto the threaded portion of said feedguide rod rearwardly of said drive spindle for applying a forward pushing force to the drive spindle upon relative rotation of the feed nut while the drive spindle is rotating to drive the tool bit support and thereby pull the drive spindle and drive coupler and tool bit support in abutment with each other toward the anchor station established by the anchor forming assembly to control cutting action of the tool bit against the pipe wall portion to be cut.

9. A pipe and prepping apparatus capable of use in severely restricted spaces to be mounted on a hollow pipe in supported relation thereby gripping a cylindrical surface of the pipe, and form a predetermined bevel shape defining a truncated conical pipe and configuration to prepare the pipe for welding, comprising a rotatable tool bit carriage to be positioned immediately adjacent an end of the pipe to be prepped and located in concentric relation with the center axis of the pipe, the tool bit carriage having a front working end and a rear drive end spaced toward the pipe end from the front end and having a plurality of tool bit sockets for receiving elongated tool bits therein projecting along axes lying in a conical path diverging outwardly from the center axis of the carriage progressively from the rear to the front end thereof, the tool bits being located in a pair of mutually perpendicular diametric planes containing the axis of the tool carriage in a predetermined cutting attitude disposing cutting tips thereof in a truncated conical path corresponding to the bevel shape to be formed on the pipe end to engage and cut into the pipe end upon advancing movement of the carriage, a drive motor for the tool bit carriage to be located outwardly adjacent the pipe end and having a rotatable drive spindle to be aligned with the center axis of the pipe and project toward the tool bit carriage, a rotatable drive coupler releasably coupled to said tool bit carriage at the rear drive end thereof and to said drive spindle for rotation about the pipe center axis, an anchor forming assembly for supporting the tool bit carriage from the pipe comprising a radially expandable and contractable annular collet defining a cylindrical pipe gripping surface to engage and be forced into tightly gripping relation with a cylindrical surface portion of the pipe wall spaced inwardly along the pipe from the end to be cut, a collet adjusting nut and a collet abutting member intercoupled with each other by a threaded connection and having shaped surfaces engageable with coactive confronting surface portions of the collet to deform the collet into tight gripping engagement with the confronting pipe wall surface upon relative rotary movement of the adjusting nut relative to the abutting member, said anchor forming assembly providing a stationary anchor station forwardly adjacent and beyond the portion to be cut spaced along the pipe axis in a direction opposite the direction of the drive coupler from the pipe end, and a feed control assembly coupled to said anchor forming assembly having a manually adjustable threaded member and including means for supplying advancing force to said drive coupler and tool bit carriage for moving the drive coupler and tool bit carriage at a precisely controlled feed rate in relation to the anchor station and advance the cutting tips into the pipe wall to be cut in predetermined relation to rotation of the threaded member of the feed control assembly for precisely controlling the depth and speed of cut made by the tool bits, said tool bit carriage being a truncated conical body having grooves in the periphery of a cross section corresponding to the cross section of the tool bits to receive the tool bits therein with their radially outermost surfaces flush with the conical outer periphery of the tool bit carriage and the cutting end portions of the tool bits projecting forwardly from the front working end of said carriage, and a tool bit retainer of generally cylindrical configuration having a truncated conical well conforming to the major portion of the truncated conical carriage and tool bits supported therein to receive the carriage and tool bits in nested relation within said well, and said drive coupler having a threaded neck portion projecting through the tool bit retainer and into a threaded socket in said tool bit carriage to assemble the same together.

4,114,485

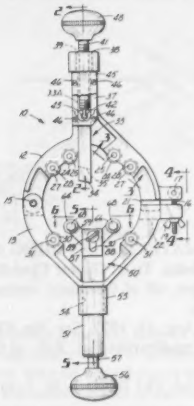
PIPE CUTTER AND BEVELER

Sanford E. Coblitz, Ashtabula, Ohio, and Bengt G. Bjalme, Erie, Pa., assignors to Wheeler Manufacturing Corporation, Ashtabula, Ohio

Filed Dec. 23, 1976, Ser. No. 754,081
Int. Cl.[2] B23B *3/22, 3/04;* B23D *21/06*
U.S. Cl. 82—4 C **13 Claims**

1. Apparatus for cutting and beveling plastic pipe including in combination a closed frame comprising first and second frame members, each said first and second frame members having first and second end portions and having a semicircular configuration, pivot means pivotally connecting said first end portions of said first and second frame members together whereby said frame members may be swung between open and closed positions, said frame members in said closed position forming a generally circular configuration, adjustable latching means for connecting said second end portaions of said first and second frame members together in said closed position, said adjustable latching means providing a means for adjusting the proximity of said second end portions of said frame members in their said closed position and thereby adjusting the circumferential extent of said generally circular configuration, cutting blade means including a cutting edge and a beveling edge, means mounting the cutting blade means on said first frame member for radial movement of said cutting blade means

between a retracted position and a cutting position, a first pair of rollers rotatably mounted on said first frame member, said first pair of rollers positioned one on either side of said cutting blade means, roller slide means including a second, third and fourth pair of rollers rotatably mounted on said roller slide means, means mounting the roller slide means on said second frame member for radial movement of said roller slide means between a retracted position and a supporting position, said rollers on said roller slide means and said rollers on said first



frame member supporting a pipe in said supporting position of said roller slide means and said closed position of said first and second frame members, said rollers of said second pair of rollers being mounted at opposed portions of said roller slide, said rollers of said third pair of rollers being mounted respectively at opposed ends of one of said rollers of said second pair of rollers, and said rollers of said fourth pair of rollers being mounted respectively at opposed ends of the other of said rollers of said second pair of rollers.

4,114,486

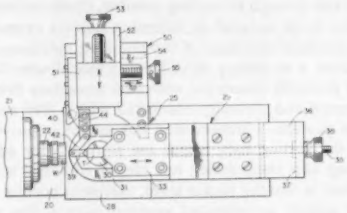
LATHE FOR GENERATING SPHERICAL OR ASPHERICAL SURFACES ON WORKPIECES, METHOD FOR GENERATING ASPHERICAL SURFACES ON WORKPIECES AND WORKPIECE HAVING ASPHERICAL SURFACE

Derrell C. Hooker, Lancaster, Ohio, assignor to Aspheric Associates, Ltd., Lancaster, Ohio

Continuation-in-part of Ser. No. 568,718, Apr. 16, 1975, Pat. No. 3,977,279. This application Aug. 30, 1976, Ser. No. 718,583

Int. Cl.[2] B23B *5/40*

U.S. Cl. 82—12 **13 Claims**



1. A machine for generating a surface on a workpiece comprising

a spindle support unit supporting a spindle member carrying a workpiece for rotation about an axis extending through the workpiece,

means for rotating said spindle,

a tool-supporting unit for supporting a tool member in operative relationship with a face of the workpiece,

one of said units including a support therefor having a support pivot located along said axis for enabling relative swinging movement of the tool member across the face of the workpiece to generate a surface thereon, said support including

floating means carried thereon for floating movement relative to said pivot so that the member carried thereby may be advanced or retracted relative to the pivot and the member of the other unit, and

a mechanical linkage for controlling the movement of the member carried by said floating means, said linkage including a link having a first pivot secured to the unit carrying said floating means, in predetermined relationship to said support pivot and a second pivot connected to said floating means.

4,114,487

Patent Not Issued For This Number

4,114,488

APPARATUS FOR FEEDING AND CHECKING SEPARATED LONGITUDINAL SUBJECTS

Karl-Ulrich Vornfett, Barsbuttel, Fed. Rep. of Germany, assignor to Friederich Justus & Co., Hamburg, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,330

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 7602165[U]

Int. Cl.[2] B26D *3/20*

U.S. Cl. 83—198 **8 Claims**

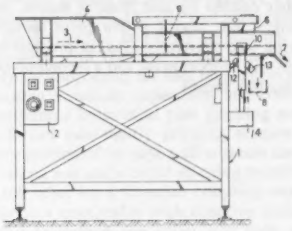
1. A device for removing discolored portions from elongated objects comprising:

feeding means for feeding elongated objects along a predetermined path, said feeding means including a portion

adapted for movement between a first position where said movable portion forms a part of said feeding means aligned with said path, and a second position where said movable portion is moved out of said path,

sensing means for sensing discolored portions within the elongated object and for producing a signal in response thereto,

moving means operatively connected to said sensing means for moving the movable portion of said feeding means between said first and second positions in response to said signal,



cutting means operatively connected to the movable portion of said feeding means and movable therewith so that when the movable portion of said feeding means is in its first position said cutting means is maintained out of the path of said elongated object and when said movable portion is moved to its second position said cutting means cuts through said elongated object so as to sever the discolored portion therefrom and removal means for removing segments cut out of said elongated objects from said cutting means.

4,114,489

DIVIDING MEANS CONTROL DEVICE

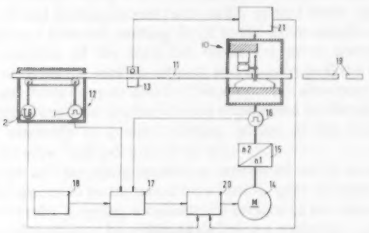
Franz Schneider; Helmut Braitinger, both of Göppingen, and Burkhard Schumann, Ottenbach, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Aug. 26, 1977, Ser. No. 828,095

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638360

Int. Cl.[2] B26D *1/56, 5/32, 5/34*

U.S. Cl. 83—298 **12 Claims**



1. A control arrangement for a variable thickness continuously fed strip stock dividing apparatus, the dividing apparatus including a drive means for driving a cutting means in a horizontal and a vertical direction, and means for effecting a vertical height adjustment of the cutting means, the control arrangement comprising: means for measuring a thickness of the variable thickness continuously fed strip stock and for providing an output signal indicative of a measured thickness of the strip stock, said measuring means being arranged in the dividing apparatus at a position upstream of the cutting means, as viewed in a feed direction of the strip stock, means operatively connected with said measuring means for controlling a speed of the driving means in response to a predetermined output signal from said measuring means, and means operatively connected with said measuring means for adjusting a height of the cutting means in response to a predetermined output signal from said measuring means whereby said measuring means correlates the speed of the driving means and height of the cutting means between minimum and maximum values in correspondence with the measured thickness of the strip stock.

4,114,490

STRIP MATERIAL DIVIDING DEVICE

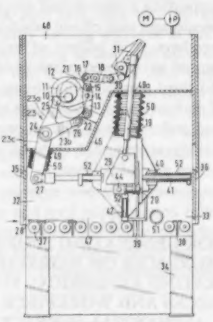
Hans Braun, Weilheim, Teck; Günter Cieslok, and Franz Wolf, both of Göppingen, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Aug. 15, 1977, Ser. No. 824,741

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636738

Int. Cl.[2] B26D *1/28, 1/56*

U.S. Cl. 83—303 **24 Claims**



1. A dividing apparatus for dividing or cutting a continuously running strip material, the apparatus including an articulated drive for a stroke movement of a cutting unit, the articulated drive being fashioned as a quadrangular linkage including a driven crank and a rocker lever pivotally connected to the driven crank through a coupling member, characterized in that the rocker lever includes an extension portion extending beyond a pivotal connection of the coupling member with the rocker lever, a secondary drive lever, a link member having a first end pivotally connected with said secondary drive lever and a second end pivotally connected with a free end of the extension portion, a transmission link means is provided for moving the cutting unit, means are provided for adjustably connecting said transmission link means with said secondary drive lever, in that the rocker lever, extension portion and link member assume an extended position over a first approximately 180° displacement of the driven crank and, over a second approximately 180° displacement of the driven crank, the rocker lever, extension portion and link member are deflected from the extended position, and in that during a total circular displacement of the driven crank, the rocker lever, extension portion, link member and secondary drive lever are moved out of a range of an extended position.

4,114,491

FULL ROTATION TYPE PAPER WEB CUTTING DEVICE

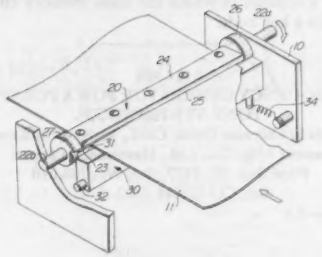
Yoshitoshi Hashimoto; Takajiro Kondo, both of Yasugi, and Toshitaka Asamoto, Matsue, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Division of Ser. No. 613,499, Sep. 15, 1975, abandoned. This application Jan. 17, 1978, Ser. No. 870,071

Claims priority, application Japan, Sep. 24, 1974, 49-108754; Aug. 20, 1975, 50-113801

Int. Cl.[2] B26D *1/56*; B23D *25/08*

U.S. Cl. 83—341 1 Claim



1. A device for cutting a moving web of paper which comprises: a shank having rotary shafts at both ends, a rotary blade affixed to said shank with its edge formed inclined circumferentially relative to the common axis of said shafts, a guide ring located adjacent to the cutting starting end of said blade and having a radius of rotation equal to that of said edge, a second guide member located adjacent to the cutting terminating end of said blade and having a volute configuration with its radius of rotation gradually decreased from the initial value equal to the radius of rotation of said edge, a stationary cutter having a straight edge and supported in place by pivot pins at both ends, said cutter being disposed in such a manner that, at the cutting terminating end, it is inclined to interfere with said rotary blade radially relative to the common axis of said shafts of said rotary blade, and a spring for forcing said edge of said stationary cutter to bear against said rotary blade.

4,114,492

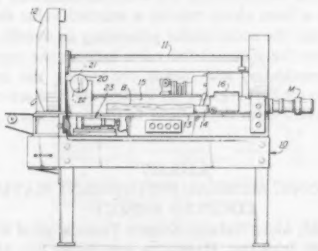
METHOD AND MACHINE FOR SLICING MATERIALS

Lawrence M. Skidmore, Phoenix, Ariz., assignor to Armour and Company, Phoenix, Ariz.

Filed Jan. 31, 1977, Ser. No. 763,994

Int. Cl.[2] B26D *4/24*, *5/32*

U.S. Cl. 83—367 6 Claims



1. In a slicing machine which includes a slicing blade, a path along which material to be sliced may be moved toward said blade, radiation means positioned to direct gamma particles toward said material as it moves along said path whereby some of the gamma particles so directed are absorbed in said material and some pass through said material, the improvement comprising means for detecting individual particles which pass through said material and for converting energy of said particles which are so detected into an electrical signal in which the energy from each particle so detected is represented as an electrical pulse, means for digitally counting said pulses as said material moves along said path and means responsive to the count of said pulses for advancing said material along said path and toward said blade at a speed which is inversely proportional to the number of pulses so counted.

4,114,493

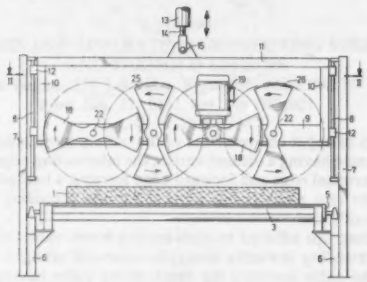
CUTTING DEVICE WITH ROTATING CUTTERS

Helmut Paulus, Herzogenrath, Fed. Rep. of Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 16, 1977, Ser. No. 778,259

Int. Cl.[2] B27B *3/04*

U.S. Cl. 83—488 10 Claims



1. Cutting apparatus comprising

a support means,

a plurality of rotatable cutting tools,

means mounting the cutting tools on the support means for rotation in a common plane,

each cutting tool having a plurality of segments, each segment carrying a cutting edge including saw teeth, the distance of each cutting edge from the axis of rotation of an associated cutting tool increasing from the leading edge of each segment to the trailing edge of the segment,

the cutting tools being arranged with segments of adjacent cutting tools being angularly displaced with respect to each other and in intermeshing relationship wherein cutting edges of adjacent cutting tools pass through a common zone,

and drive means for synchronously driving the cutting tools to prevent contact of adjacent cutting tools.

4,114,494

NOISE-CONTROLLED CIRCULAR SAW BLADE

Robert L. Budke, 10542 - 12th Ave. NW., Seattle, Wash. 98177, and Lowell C. Freeborn, 6040 Redwing St., Seattle, Wash. 98118

Continuation of Ser. No. 657,361, Feb. 12, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,636

Int. Cl.[2] B27B *33/08*

U.S. Cl. 83—835 2 Claims

1. A rotary saw blade having reduced saw plate vibration and air noise when spinning comprising:

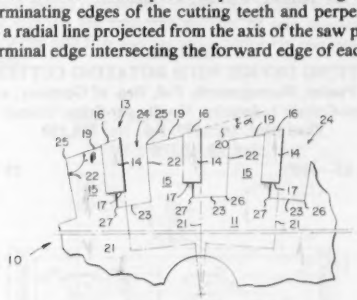
a circular saw plate having a central opening with respect to its axis and a predetermined direction of operational rotation,

cutting teeth disposed about the periphery of the saw plate,

gullets circumferentially distributed about the periphery of the saw plate between the cutting teeth, each of the gullets having (1) spaced apart first and second straight edges forming, respectively, the rearward and forward edges of the gullet relative to the direction of saw rotation and extending inwardly toward the axis of the saw plate a depth adequate for cutting action, (2) a third straight edge

forming the base edge of each gullet intersecting the rearward edge at its inward end at essentially a right angle and the forward edge thereof at its inward end at an obtuse angle having distinct vertex,

a terminal edge of the saw plate extending rearwardly of each cutting tooth at an acute angle substantially less than 90° measured with respect to a plane connecting the outer terminating edges of the cutting teeth and perpendicular to a radial line projected from the axis of the saw plate, the terminal edge intersecting the forward edge of each gullet



at its upper end rearward of the cutting tooth at an obtuse angle having a distinct vertex, the intersecting edges of the terminal edge and forward edge forming a heel portion of the saw plate giving support for the preceding cutting tooth, and

cutting tips adhered to each cutting tooth, each cutting tip extending inwardly along the rearward straight edge of the gullet less than the depth of the gullet having lateral cutting edges protruding beyond each of the opposite faces of the saw plate and a top cutting edge extending beyond the terminating edge of the saw plate.

4,114,495

CHANNEL PROCESSOR

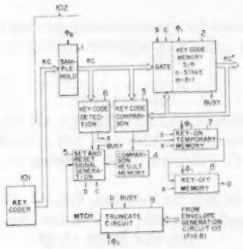
Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 13, 1976, Ser. No. 714,084

Claims priority, application Japan, Aug. 20, 1975, 50-100878; Aug. 20, 1975, 50-100879; Aug. 20, 1975, 50-100880; Aug. 21, 1975, 50-101598

Int. Cl.² G10H *1/02;* G08C *15/00*

U.S. Cl. 84—1.01 **14 Claims**



1. For use in combination with a key coder producing key codes representing key switches in operation and also producing a start code every time detection of all key switches in operation has been completed at least one time;

a channel processor comprising:

a main memory circuit including a plurality of channels for storing the key codes provided by the key coder;

a key-on temporary memory circuit having a plurality of storage locations each corresponding to a respective one of said plurality of channels in which the key codes are stored in said main memory circuit, said key-on temporary memory circuit storing, when the key code provided by the key coder coincides with a key code already stored in said main memory circuit, a key-on signal in the storage location corresponding to the channel containing said already stored key code;

a memory reset circuit for compulsorily resetting all contents stored in said key-on temporary memory circuit upon each application to said reset circuit of said start code; and

a detection circuit for detecting cease of the operation of a key switch by sensing, at the end of a period between two consecutive start codes, the absence of a key-on signal in a temporary memory circuit storage location corresponding to a channel in which the main memory circuit still contains a key code.

4,114,496

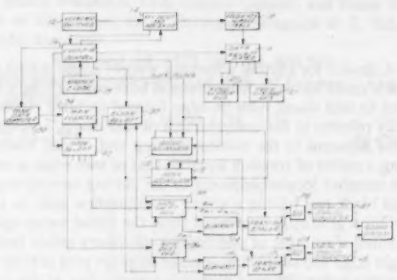
NOTE FREQUENCY GENERATOR FOR A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 10, 1977, Ser. No. 758,010

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.1 **7 Claims**



1. Apparatus for generating an audio signal having a waveform determined by a predetermined first set of digitally coded values corresponding to the relative amplitudes of a set of points on one cycle of the waveform and having a fundamental frequency determined by a selected one of a second set of digitally coded values corresponding to the fundamental frequencies of musical notes in a diatonic scale comprising:

a first register storing said first set of values, a digital-to-analog converter, means coupling the digitally coded values shifted out of the register to the converter, a shift pulse source connected to the first register for shifting said stored values from the first register to the converter in timed sequence, said source including an adder-accumulator, means incrementing the adder-accumulator periodically at a fixed clock rate by a selected value from said second set, the accumulator generating an overflow pulse whenever the accumulated value exceeds the capacity of the accumulator, and means connecting the overflow pulses to the first register for shifting the first set of values successively from the register to the converter.

4,114,497

ELECTRONIC MUSICAL INSTRUMENT HAVING A COUPLER EFFECT

Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Sigeki Isii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 29, 1976, Ser. No. 727,790

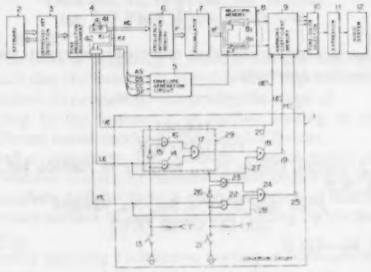
Claims priority, application Japan, Sep. 29, 1975, 50-117431

Int. Cl.² G10H *3/06*

U.S. Cl. 84—1.17 **6 Claims**

1. In an electronic musical instrument of a type having at least two keyboards, means for generating, in response to depression of a key in any one of said keyboards, a multibit key

code containing certain note information bits identifying the musical note associated with the depressed key and having other keyboard information bits identifying the specific keyboard which contains the depressed key, and tone production means for producing a musical tone according to said key code and including note production circuitry for producing a musical note having a note frequency established by said certain note information bits, and tone color control circuitry, connected to the output of said note production circuitry, for controlling the tonal quality of the produced musical tone depending on the keyboard designated by said information bits, the improvement for providing a coupler effect comprising:



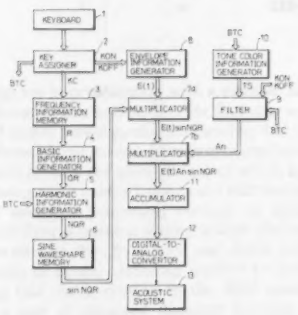
conversion means, responsive to only the keyboard information bits of the key code generated in response to depression of a key, for producing both an unconverted signal representing the keyboard designated by the keyboard information bits of said generated key code and a converted signal representing a different keyboard, said tone color control circuitry receiving and being responsive to both the unconverted signal and to the converted signal so as to produce simultaneously a combined musical tone having a note frequency established by the certain note information bits and combined tonal quality related both to the keyboard to which the depressed key belongs and to a different keyboard.

4,114,498

ELECTRONIC MUSICAL INSTRUMENT HAVING AN ELECTRONIC FILTER WITH TIME VARIANT SLOPE

Masanobu Chibana; Tsuyoshi Futamase, and Hideo Yamada, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 21, 1976, Ser. No. 734,664
Claims priority, application Japan, Oct. 23, 1975, 50-127820
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.19 **5 Claims**



1. An electronic musical instrument of a type wherein amplitudes of frequency components constituting a musical tone are individually set in accordance with a desired filter characteristic comprising means for changing a slope portion of the filter characteristic, said means comprising:

a filter slope information generation circuit for generating a filter slope variation function $a(t)$ which changes with time;

a cut-off frequency information generation circuit for generating cut-off frequency information COF which also changes with time;

a memory for storing frequency logarithm information log N of frequencies of respective harmonic orders;

a subtractor for conducting subtraction log N − COF on the basis of the cut-off frequency information COF and the frequency logarithm information log N; and

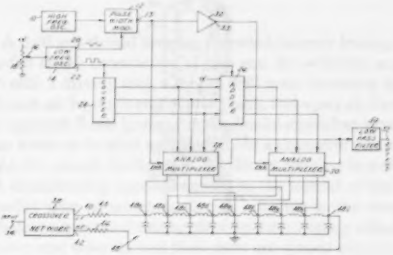
a multiplicator for multiplying the filter slope variation function $a(t)$ with a value (log N- COF).

4,114,499

METHOD AND APPARATUS FOR SECURING VIBRATO AND TREMOLO EFFECTS

Eric von Valtier, 521 Leicester, Plymouth, Mich. 48179

Filed Jan. 27, 1977, Ser. No. 763,021
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.25 **41 Claims**



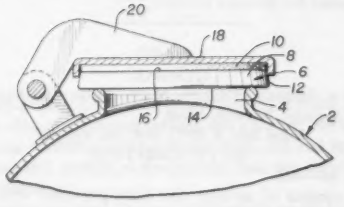
1. In a method for producing vibrato and tremolo effects in electrical signals which includes the steps of receiving an input signal, injecting said signal into a multiple-segment delay line and scanning said delay line to produce an output signal, the improvement comprising the steps of separating said input signal into high and low frequency components and injecting said components into opposite ends of said delay line, randomness of signals scanned in said delay line being increased by varying delay and phase shift imparted to said frequency components by segments of said delay line.

4,114,500

PAD FOR WOODWIND MUSICAL INSTRUMENT

Edwin Norbeck, Iowa City, Iowa, assignor to The University of Iowa Research Foundation, Iowa City, Iowa

Filed May 20, 1976, Ser. No. 688,503
Int. Cl.[2] G10D *9/04*
U.S. Cl. 84—385 P **6 Claims**



1. A valve pad for a musical instrument, said pad comprising an elastomer disc formed of silicone rubber which has a Shore

A durometer of about 20 to 60 and a compression set no greater than about 5%, said compression set being determined after applying for 22 hours at about 23° C. a force which compresses the composition about 25% and measuring the thickness 30 minutes after said force is released, said compression set being equal to

$$(t_o - t_i)/(t_o - t_s) \times 100$$

where

t_o is the original thickness of the specimen,

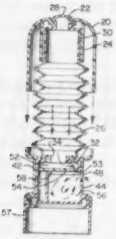
t_i is the final thickness of the specimen and

t_s is the thickness of the specimen when compressed by said force.

4,114,501
MUSICAL TOY

Atsuo Tanaka, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,406
Claims priority, application Japan, Oct. 20, 1975, 50-143001[U]
Int. Cl.[2] G10D *9/00*
U.S. Cl. 84—330 **6 Claims**



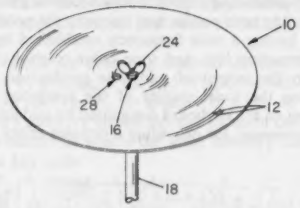
1. A toy, comprising a plurality of sound producing mechanisms for producing different musical notes, each of said sound producing mechanisms having an upper portion with a bellows-like mechanism, a lower housing having an external wall with an opening therethrough and at least one internal wall surface, an upper housing complementary in configuration to said external wall of said lower housing and slidably mounted thereon, said bellows-like mechanism extending into said upper housing, a disc positioned between said upper and lower housings, said disc having a slit therethrough and at least one ridge on the bottom thereof located to abut said internal wall surface to define an air chamber in said lower housing, said plurality of sound producing mechanisms having the same size bellows-like mechanism, upper housing, lower housing and disc, the size of said slit and the location of said ridge and internal wall surface being selected to produce the particular note of each of sound producing mechanisms whereby each of said sound producing mechanisms may be manufactured by assembling all elements except said disc and lower housing from a common stock pile of parts, said disc and lower housing being individually selected for the note desired.

4,114,502
CYMBAL

Armand A. Zildjian, Hingham, Mass., assignor to Avedis Zildjian Company, Norwell, Mass.

Filed Jun. 9, 1977, Ser. No. 804,921
Int. Cl.[2] G10D *13/06*
U.S. Cl. 84—402 **3 Claims**

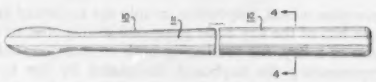
1. A cymbal of annular disc form provided with surface tonal grooves and adapted to be centrally suspended from a support device for playing, having a first mounting aperture generally centered on the cymbal and a second mounting aperture laterally offset from said first mounting aperture, the center of said second aperture being spaced within two inches from the center of said first aperture, said cymbal having different characteristic tones when mounted to a support stand by said respective apertures.



4,114,503
DRUMSTICK

Phillip J. Petillo, Ocean, N.J., assignor to Ambico Inc., Lynbrook, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,494
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—422 S **13 Claims**



1. An elongated drumstick comprising:

a core having extending arms when viewed in cross-section, said arms extending along at least a substantial portion of the length of the drumstick; and

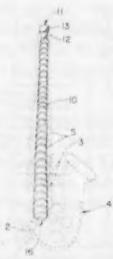
an outer sheath filling in the voids between adjacent ones of said arms and extending to the outer surface of the drumstick;

said core being made of a material having a tensile and shear strength greater than that of said sheath and said sheath being bonded to said core and being made of a material compatible with the hand of a user and adapted to cooperate with a drumhead so as to set up appropriate vibrations therein when the two are percussively engaged.

4,114,504
DEMOISTURIZER FOR WIND MUSICAL INSTRUMENTS

George Koregelos, 470 Mountain Ave., Piedmont, Calif. 94611

Filed Jul. 25, 1977, Ser. No. 818,553
Int. Cl.[2] G10G *7/00*
U.S. Cl. 84—453 **9 Claims**



1. A device for demoisturizing the inside walls and valve pads of a wind musical instrument having valve openings comprising:

a. an elongated semi-rigid member having a length selected

to span a substantial portion of the sectional length of said instrument;

b. a plurality of filaments attached along a substantial portion of the length of said semi-rigid member and extending outwardly therefrom and having a length dimensioned to touch the inside walls of said instrument and to extend through the valve openings and touch said valve pads.

4,114,505

COATINGS AND METHODS OF APPLICATION

William J. Loeser, 4911 Valkeith, Houston, Tex. 77096, and Julius A. Loeser, 5828 County Rd. 910, Houston, Tex. 77037

Filed Jan. 31, 1977, Ser. No. 763,725

Int. Cl.[2] F16B *33/06*; C25D *5/48*

U.S. Cl. 85—1 C **7 Claims**

1. A method of preparing a metallic nut and bolt type fastener such that the fastener is operable after exposure in and to a deleterious environment, comprising the steps of

applying to the fastener a protective coating of another different metal anodic to the metallic fastner,

thereafter enhancing the cohesion characteristics of said protective coating by immersing said object in a metallic phosphate bath to form a chemical reaction film on the exterior surface of said protective coating on the fastener, and

thereafter applying a lubricious coating of flurocarbon polymer resin to said chemical reaction film on said protective coating for providing the fastener with an external lubricious surface which enhances fastener operability after exposure of the fastener in and to the deleterious environment.

4,114,506

SELF-TAPPING WING NUT

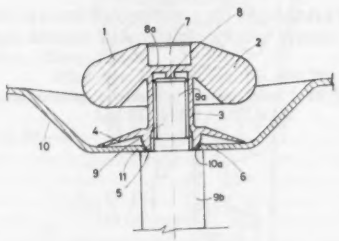
Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia, S.p.A., Turin, Italy

Continuation of Ser. No. 648,833, Jan. 14, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,093

Claims priority, application Italy, Jan. 14, 1975, 19240/75

Int. Cl.[2] F16B *37/14*

U.S. Cl. 85—32 W **3 Claims**



3. A wing nut in combination with a multiple diameter stud having a threaded free end portion for fastening a cover to the air filter of motor vehicles, characterized in that the wing nut is formed from plastic material and is provided with a resilient tubular shank portion the inner surface of which is self-tapping when the wing nut is axially forced onto said free end threaded portion of said stud projecting through an aperture in the cover of said filter, a resilient sealing washer-like collar portion intended to abut on the cover wall, said shank portion including a plurality of axially extending resilient hook-like portions for locking said shank portion to the filter cover, said stud including a pair of enlarged diameter portions each being successively greater than the threaded free end portion, the first of which is positioned adjacent said threaded portion forcing said hook portions laterally into locked engagement with said cover and said second enlarged diameter portion forming a shoulder against which said hook-like portions abut to prevent overdriving of said nut.

4,114,507

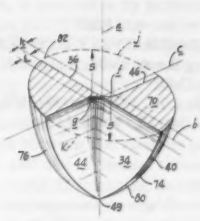
DRILL SCREW

Donald A. Fischer, Strongsville; Edwin M. Lipowski, North Olmsted, and William E. Kalt, Bay Village, all of Ohio, assignors to The Kalt Manufacturing Company, North Ridgeville, Ohio

Filed Nov. 17, 1976, Ser. No. 742,631

Int. Cl.[2] F16B *25/00*

U.S. Cl. 85—41 **2 Claims**



1. A drill and thread forming threaded fastener having a roll threaded shank constructed at one end for selective engagement with a driving tool, a forged drill point including jagged flash parts at the other end of said shank, and a pair of diametrically opposed flutes having longitudinally extending generally planar surfaces located substantially in a diametric plane containing the axis of the fastener, said flutes forming in said drill point diametrically opposed quadrants the termini of the leading radial sides of which quadrants referring to the direction the fastener is rotated during driving form cutting edges, the improvement wherein said flash parts are spaced circumferentially from said cutting edges.

4,114,508

SELF-DRILLING SCREW

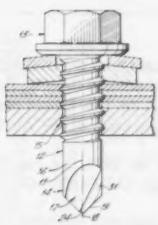
Harvey Philip Jeal, Stevenage, England, assignor to Aerpat A.G., Zug, Switzerland

Filed Jan. 10, 1977, Ser. No. 758,450

Claims priority, application United Kingdom, Jan. 9, 1976, 780/76

Int. Cl.[2] F16B *25/00*

U.S. Cl. 85—41 **1 Claim**



1. A self-drilling and self-tapping screw comprising a shank having a self-tapping thread thereon and a head at one end, the shank being rotatable about a longitudinal axis and including an entering end portion at its opposite end, the entering end portion comprising:

a single sharp pointed tip lying substantially on the longitudinal axis of the shank;

a first cutting edge inclined to the longitudinal axis of the shank and extending from the tip at the leading end of the

first cutting edge to the periphery of the entering end portion;

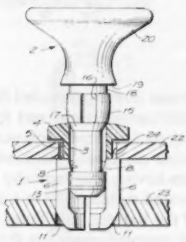
and a second cutting edge inclined to the longitudinal axis of the shank substantially identically to the first cutting edge and on the side thereof opposite to the first cutting edge and extending from a leading end to the periphery of the entering end portion, the leading end being offset from the tip both radially outwardly of and rearwardly longitudinally along the longitudinal axis of the shank, the length the second cutting edge being greater than one half of the length of the first cutting edge the leading end of the second cutting edge inclined to the longitudinal axis being defined by a second sharp pointed tip.

4,114,509

FASTENER PLUNGER ENTRY RESISTANCE MEANS

L. Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Jun. 22, 1977, Ser. No. 808,817
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—84 **2 Claims**



1. A fastener adapted to be secured in a perforated member, the fastener comprising:

a. a grommet having a sleeve portion with an entry end and a set of fingers continuing from its other end;

b. A plunger having an expander portion slidable through the sleeve portion to engage inwardly inclined surfaces on said fingers and expand the fingers, and a radially contractable ring of normally greater diameter than the inside of said sleeve and spaced from said expander portion a distance no greater than the distance from said entry end to said inclined surfaces and thereby being engageable with the sleeve portion prior to expansion of the fingers by the expander portion, whereby the friction between the sleeve and ring increases the total force required to spread the fingers.

4,114,510

MUZZLE CLAMP ASSEMBLY

Ronald E. Prince, Winooski, and Rene W. Bonnette, Burlington, both of Vt., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

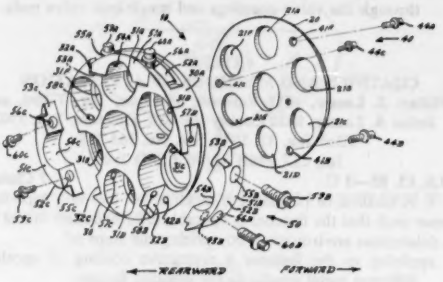
Filed Apr. 28, 1977, Ser. No. 791,753
Int. Cl.[2] F41D *7/04*
U.S. Cl. 89—12 **7 Claims**

1. A muzzle clamp assembly, adapted for use with a multi-barrel gun, wherein each barrel has a muzzle end, comprising:

a. a front plate having a first plurality of openings therein and therethrough, one opening for each barrel of said multi-barrel gun, with each opening so dimensioned and configurated to accept, snugly fit on, and surround said muzzle end of its respective barrel, wherein said openings are located at preselected positions on and in said front plate;

b. a clamp member, disposed rearward of said front plate, having a first plurality of openings therein and therethrough, one opening for each of said first plurality of front plate openings, with each said clamp member opening of said first plurality and in eccentric geometric relationship with and to its respective front plate opening;

c. means for releasably connecting said front plate to said clamp member;



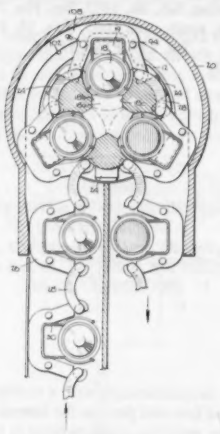
d. and, means for removably attaching said front plate, said clamp member, and said releasable front plate-to-clamp member connecting means, to said multi-barrel gun at the muzzle end of said barrels of said gun.

4,114,511

ENDLESS CONVEYOR MECHANISM

Raymond Arthur Patenaude, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed May 25, 1977, Ser. No. 800,510
Int. Cl.[2] F42B *39/08*
U.S. Cl. 89—33 CA **12 Claims**



1. A conveyor system comprising:

a plurality of rigid, substantially U-shaped conveyor elements disposed in a series;

a like plurality of resilient means, each resilient means secured to a respective conveyor element, for releasably retaining an article to said conveyor element; and

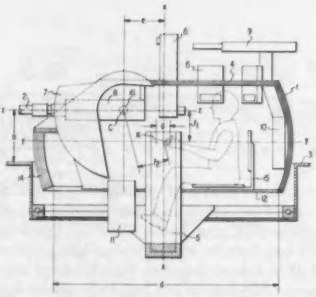
a plurality of rigid links, each link respectively disposed between and intercoupling two adjacent conveyor elements;

each of said resilient means also serving to releasably capture the respective two intercoupling links to the respective conveyor element.

4,114,512
STABILIZED TURRET

Lutz Schwendt, Vellmar, Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Germany

Filed Mar. 15, 1971, Ser. No. 124,428
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1970, 2014389
Int. Cl.[2] F41H *5/20*
U.S. Cl. 89—36 K 8 Claims

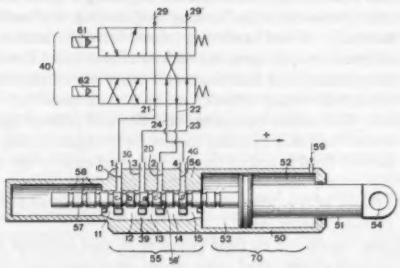


1. In an armored turret for light weapons, and in particular automatic weapons, said turret being mounted within a well in the roof of an armored vehicle so that it is movable about a plurality of mutually perpendicular axes one of which is a horizontal elevation axis, and having a primary weapon mounted in the front thereof, the improvement wherein: said turret is mounted in said well so that its cardanic suspension point is vertically disposed between said roof of said vehicle and the plane of the bore axis of said primary weapon when it is horizontally aligned and at a height between 30% and 70% of the vertical distance between the bore axis of the horizontally aligned primary weapon and said vehicle roof; the side wall of the outer shell of said turret is substantially spherical with respect to said cardanic suspension point; and said turret is open to said well along its entire lower end.

4,114,513
STEP-BY-STEP CONTROLLED SERVOMECHANISM

Philippe Maurice Henri Debrus, Paris, France, assignor to D.B.A., Clichy, France

Filed Apr. 26, 1976, Ser. No. 680,599
Claims priority, application France, May 2, 1975, 75 13850
Int. Cl.[2] F15B *15/17, 9/02*
U.S. Cl. 91—19 4 Claims

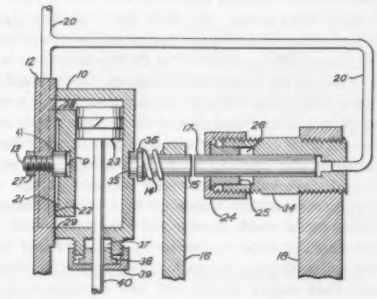


1. A step-by-step controlled servomechanism of the type comprising, a driving element (51, 57) movable in a case (50) which it divides into two chambers (52, 53) and provided with a plurality of receiver ports (58), a high pressure supply (59) continuously applied to one of said chambers (52), a high pressure source (29) and a low pressure source (29'), and, an upstream distributor means (40, 56) adapted to be connected to said high pressure source (29) and to said low pressure source (29') and to supply said receiver ports (58) and having a number of transmitter ports (1, 2, 3, 4) which are independent of the number of receiver ports (58), said transmitter ports (1, 2, 3, 4) being capable of being connected, in pairs, respectively to said low pressure source (29') and to said high pressure source (29), a downstream distributor means (39, 41) having a plurality of manifold ports (11, 12, 13 . . .) capable of communicating with the other of said chambers (53), all of said receiver ports (58) being capable of being made to open in succession into one of said manifold ports (11, 12, 13 . . .), said upstream distributor means (40) including selecting means (61, 62) capable of effecting the connection, in succession by permutation and simultaneously, at least one pair (1, 3) of transmitter ports to said high pressure source (29) and to said low pressure source (29'), respectively, said downstream distributor means (39, 41) being capable of effecting the connection of at least one manifold (port (11, 12, . . .) to said other chamber (53), the distances between said transmitter ports (1, 2, 3, 4) and their lengths, firstly, the distances between said receiver ports (58) and their lengths, secondly and the distances between said manifold ports (11, 12, 13 . . .) and their lengths, thirdly, being such that, by a step-by-step displacement in one direction of said drive element (51, 57) it is possible to bring each time said element to a position in which there is no communication between said transmitter ports (1, 3) of said pair, respectively connected to said high pressure source (29) and to said low pressure source (29'), and said manifold port (12) connected to said other chamber (53), but that any displacement in one direction or the other of said drive element (51, 57) ensures the communication of said manifold port (12) with one or the other of said transmitter ports (1, 3) to resist an external force on said drive elements (51, 57), and, that one of the ports of a following pair of transmitter ports (2, 4) to be connected respectively to said high pressure source (29) and to said low pressure source (29') communicates with at least one of the following manifold ports to be connected to said other chamber (53).

4,114,514
OSCILLATING STEAM ENGINES

Howard J. Lettine, and Anthony Lettine, both of R.D. 4, Box 352, Middletown, N.Y. 10940

Filed May 26, 1976, Ser. No. 690,171
Int. Cl.[2] F01B *15/06*
U.S. Cl. 91—211 2 Claims



1. In an oscillating engine comprising: a cylinder capable of oscillating, a first rigid trunnion mounted on a stationary valve plate and supporting one side of said cylinder, fluid supply and exhaust passages connected to said valve plate, said side including a portion slidable on said valve plate and forming therewith valve means, said one side including a recess which opens toward said valve plate, a second trunnion slidable mounted in a support plate and bearing on a side of said cylinder opposite said one side, a coil spring encircling said second

trunnion, one end of said spring bearing on a shoulder of said second trunnion and another end of said spring bearing on the support plate, a stationary cylinder connected to said supply passage and having a plunger slidably mounted therein, said plunger extending through one end of said stationary cylinder into engagement with the second trunnion as a result of fluid supplied through said stationary cylinder from said supply passage.

4,114,515

ADJUSTABLE SELF-RECIPROCATING OPERATOR

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 600,515, Jul. 30, 1975. This application Jul. 1, 1976, Ser. No. 701,616
Int. Cl.[2] F01L *25/06*
U.S. Cl. 91—284 **5 Claims**

1. An adjustable self-reciprocating valve comprising:

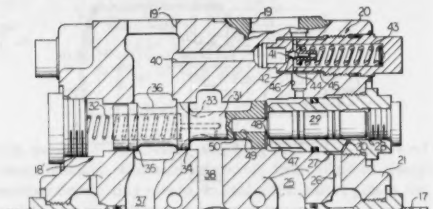
a valve housing including a central shuttle valve means therein and a slave valve means housed alongside thereof, a differential valve member having small and large fluid responsive surfaces in opposition to each other in said shuttle valve means, said differential valve member also having a cycle frequency control means including an adjustable biasing force means for regulating and adjusting said slave valve means, a working fluid supply and first exhaust means in said valve housing, said slave valve means further including a pressurized cavity fluid delivered by said working fluid for said shuttle valve means, a second separate exhaust means for said cavity fluid from said slave valve means, said slave valve means triggering and controlling an automatic reciprocation of said shuttle valve means when subjected to fluid pressure, at least a pair of side ports in said valve housing entering said shuttle valve means and a first of said ports supplying working fluid thereto comprising said working fluid supply means while a second of said ports leading to a receiver thereof, a perpendicular opening inside said second side port to feed said slave valve means with said cavity fluid when said receiver pressure builds up to a value sufficient to perform useful work therein and also to trip said slave valve means in order to initiate operation of said shuttle valve automatically, means for fluid communication between fluid supply source and said receiver such as a power cylinder provided with a piston including means for piston return requiring the supply and exhaust of the working fluid in a sequence in order to sustain a specific cycle frequency of said piston within the desired operational limitations such as a few cycles per minute including a few thousands cycles per minute, and a sequential fluid exhaust from said receiver via said first fluid exhaust means to facilitate subsequent exhaust of said cavity fluid from said slave valve means at the end of each piston cycle.

4,114,516

ANTI-CAVITATION AND PRESSURE MODULATING RELIEF VALVE FOR CONTROLLING HYDRAULIC CYLINDERS

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 15, 1976, Ser. No. 732,558
Int. Cl.[2] F15B *11/08, 13/02*
U.S. Cl. 91—420 **13 Claims**



1. A control circuit comprising

a double-acting cylinder means having a rod end and a head end,

a pressurized fluid source, including a reservoir,

directional control valve means connected between said fluid source and said cylinder means for communicating pressurized fluid to one of the rod and head ends of said cylinder means upon selective actuation of said directional control valve means,

modulating valve means directly responsive to pressurized fluid communicated to said cylinder means exceeding a predetermined level for simultaneously modulating exhaust of fluid from the other one of the rod and head ends of said cylinder means to said reservoir directly upon said selective actuation of said directional control valve means, said modulating valve means comprising a spool reciprocally mounted in a housing and having a plurality of normally closed metering slots formed thereon and adapted to open upon movement of said spool for modulating exhaust of fluid from said other one of the rod and head ends of said cylinder means to said reservoir,

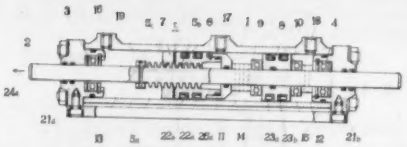
check valve means connected between said pressurized fluid source and said cylinder means for communicating pressurized fluid to one of the rod and head ends of said cylinder means and for preventing fluid flow thereby upon exhaust of the other one of the rod and head ends of said cylinder means, and

means responsive to fluid pressure in said cylinder means including pilot relief valve means interconnected between said directional control valve means and said other one of the rod and head ends of said cylinder means and opening to permit fluid flow to act on said modulating valve means for moving said spool to open said slots for exhausting fluid pressure from said cylinder means and to said reservoir when such fluid pressure exceeds a predetermined level.

4,114,517
DOUBLE ACTING ACTUATOR

Hiroshi Teramachi, 2-34-8 Higashi-tamagawa Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 655,446, Feb. 5, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,667
Claims priority, application Japan, Jun. 24, 1975, 50-078463; Oct. 16, 1975, 50-124565
Int. Cl.[2] F01B 21/02
U.S. Cl. 92—2 4 Claims

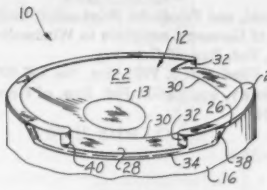


1. An actuator, operated by hydraulic fluid under pressure, comprising, in combination, a cylinder having a non-circular cross-section and having a center axis; end walls closing the opposite ends of said cylinder; first, second and third non-circular pistons conformingly engaged in said cylinder dividing the cylinder interior into first and second end chambers and an intermediate chamber, with said first and second pistons having a small axial spacing therebetween; said first end chamber being defined axially by one end wall and said second piston, said second end chamber being defined axially by the other end wall and said third piston, and said intermediate chamber being defined axially by said first and third pistons; a piston rod, extending through said pistons and said end walls, having at least one male spiral thread with a predetermined helical angle at a predetermined pitch, said piston rod extending along said center axis of said cylinder, said first piston being provided with at least one female spiral thread engaged with said male spiral thread of said piston rod; said third piston and said piston rod being relatively rotatable; abutment means on opposite sides of said third piston locking said third piston against axial displacement along said piston rod; limit means on said piston rod engageable with said one end wall, to limit movement of said piston rod outwardly through said one end wall, and engageable by said second piston; and three ports each opening to a respective one of said three chambers, and through which hydraulic fluid is selectively supplied into and exhausted from said three chambers, said actuator having an initial position in which said abutment means engage said other end wall and said first piston, and said limit means is spaced axially from said second piston and said one end wall; said third piston, responsive to supply of pressure fluid to either side thereof with the other side thereof connected to exhaust, effecting only rectilinear movement of said piston rod and said first and second pistons as limited by engagement of said limit means and said abutment means with the associated end walls, without rotation of said piston rod; said first and second pistons, with said third piston remaining stationary, due to equal pressure on its opposite sides, and restraining rectilinear movement of said piston rod, conjointly moving axially of said piston rod, to rotate the latter in respective opposite directions while maintaining said small axial spacing therebetween, responsive to supply of pressure fluid to one of said first end intermediate chambers with the other of said first end and intermediate chambers connected to exhaust, respectively; said first piston, upon engagement of said second piston with said limit means, exerting a torque on said second piston, tending to decrease said small axial spacing, firmly engaging said second piston with the interior surface of said cylinder at two circumferentially spaced first points with the reaction torque firmly engaging said first piston with the interior surface of said cylinder at two circumferentially spaced second points, with such action occurring, in the opposite sense of rotation, when said first piston engages said abutment means; whereby said piston rod is firmly locked at each of its limits of rotation.

4,114,518
PISTON VALVE POCKET RELIEF

Glen A. Glover, Jr., Washington, and Robert B. Cambron, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,630
Int. Cl.[2] F16J 1/00
U.S. Cl. 92—208 3 Claims



1. In a piston including a cylindrical sidewall and a top face having a concave portion substantially concentric with the sidewall, the improvement comprising:

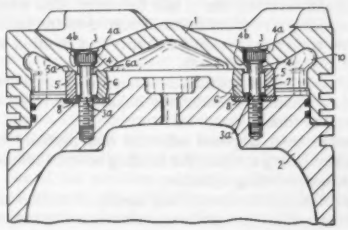
a plurality of pockets formed in the top face and having an opening terminating at a first circumferential width through the sidewall interconnecting the concave portion and the sidewall, said pockets extending downwardly from the top face terminating at a first depth along the sidewall; and

an arcuate relief associated with each pocket, each relief being formed in and concentric with the sidewall overlapping the opening of an associated pocket, terminating at a second width about two times greater than the first width and extending downwardly from the top face to a second depth greater than said first depth.

4,114,519
PISTONS

David Clement Speaight, Lymington, England, assignor to Wellworthy Limited, Lymington, England

Filed Oct. 4, 1976, Ser. No. 729,098
Claims priority, application United Kingdom, Oct. 8, 1975, 41338/75
Int. Cl.[2] F16J 1/00
U.S. Cl. 92—221 7 Claims



1. An internal combustion engine piston comprising:

a piston body,

a separate crown,

a plurality of bolts for attaching said crown to said body,

two heat resistant metallic concentric ring members each disposed in abutting engagement between the adjacent faces of said crown and said body inwardly of the periphery thereof and so as to define an annular gap between said ring members, said bolts passing through said annular gap,

one of said ring members being relatively rigid, and the other of said ring members being resilient, said ring members cooperating to permit variation in the alignment of said

two adjacent faces resulting from thermal conditions arising during the operation of said piston and to support said crown to withstand gas pressures during operation of said piston.

4,114,520

APPARATUS FOR MAKING BAGS FROM A CONTINUOUSLY FED THERMOPLASTIC TUBULAR WEB OF FILM

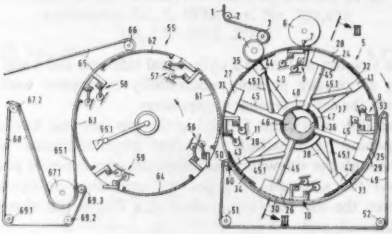
Fritz Achelpohl, and Friedhelm Brinkmeier, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,697

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616574

Int. Cl.[2] B31B *23/60*

U.S. Cl. 93—33 H **5 Claims**



1. Apparatus adapted for connection to a source of suction air for making bags from a continuously fed thermoplastic tubular or semi-tubular web of film comprising:

a first transverse welding cylinder having a surface for receiving a tubular web of film;

means for rotating said first transverse welding cylinder so that the peripheral speed of its surface is higher than the speed of the continuously fed web of film;

transverse severing means for severing tubular sections having first and second ends from the received tubular web of film, said transverse severing means comprising a rotary knife cylinder positioned adjacent the surface of said first transverse welding cylinder and having a heated knife acting on the surface of said first transverse welding cylinder;

first controlled welding tongs carried by said first welding cylinder for gripping and welding second ends of severed tubular sections, one of said first controlled welding tongs including a resilient portion located on the surface of said first transverse welding cylinder in a position to be acted on by said heated knife;

air suction boxes positioned on the surface of said first transverse welding cylinder for holding the received tubular web of film;

pressure belts disposed adjacent and partially enveloping said welding cylinder for holding severed tubular sections on said welding cylinder;

control means for controlling supply of suction air from the source of suction air to said air suction boxes so that only the air suction boxes positioned between the position where the tubular web of film is received and the start of the pressure belts receive suction air;

a second transverse welding cylinder positioned adjacent said first transverse welding cylinder for receiving severed tubular sections from said first transverse welding cylinder;

second controlled welding tongs carried by said second transverse welding cylinder for gripping first ends of the received tubular sections;

blow nozzle means for directing first ends of the received tubular sections away from said first transverse welding cylinder and for directing the first ends towards said second transverse welding cylinder, said blow nozzle means being located beneath and radially directed toward the surface of said first transverse welding cylinder; and

means for rotating said second transverse welding cylinder, said means being operatively associated with said means for rotating said first transverse welding cylinder so that the phase position of the rotary movements of said first and said second transverse welding cylinders is adjustable to accommodate different widths of severed tubular sections.

4,114,521

VENTILATION METHOD AND SYSTEM FOR PROTECTING SHOOTERS FROM POLLUTANTS

Theodore N. Busch, Minneapolis, Minn., assignor to Caswell Equipment Co., Minneapolis, Minn.

Continuation-in-part of Ser. No. 706,582, Jul. 19, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,487

Int. Cl.[2] F24F *9/00*

U.S. Cl. 98—36 **10 Claims**

1. A shooting stall for shooting ranges having a target area at one end of the same at which a weapon is to be fired and having a normal air flow substantially from the shooting stall toward the target area comprising: at least a pair of spaced and parallel side walls adapted to be mounted in a shooting range remote from the target area, said walls defining a shooter position; and an air discharge structure positioned in each of the side walls of the shooting stall, said air discharge structure being adapted to be connected to a source of air under pressure and being oriented in the shooting stall for directing a stream of air generally transverse to the normal air flow toward the target area intermediate a shooter in the shooting stall and toward the discharge portion of the weapon held by the shooter when the shooter fires from a shooting position, said stream of air having a rate of flow at least in the ratio of 2 to 1 with the normal air flow toward the target area to direct contaminants away from the shooter.

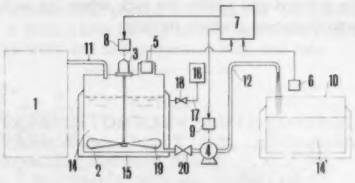
10. The method of reducing the hazard of a shooter absorbing the pollutants resulting from the discharge of his weapon in an indoor shooting range having shooting stalls, a target area at which a weapon is fired and a normal air flow substantially from the shooting stalls toward the target area comprising, providing air jet means in said stall positioned for interjecting streams of air from opposite sides of the stall intermediate the shooter's face and the discharge part of his weapon when being fired, and blowing a stream of fresh air through said jets generally transverse to the airflow toward the target area at a rate at least twice that of the normal air flow.

4,114,522

METHOD AND APPARATUS FOR AUTOMATICALLY DETECTING AND CONTROLLING THE DEGREE OF CARAMELIZATION OF CANDIES

Kazuaki Nagamine, Mishima, Japan, assignor to Morinaga & Co., Ltd., Japan

Filed Jun. 28, 1977, Ser. No. 811,132
Claims priority, application Japan, Jul. 19, 1976, 51-85790
Int. Cl.[2] A47J 37/10
U.S. Cl. 99—348 5 Claims



4. An apparatus for controlling the degree of caramelization of candy comprising; cooker means for preparing a boiled-down caramelizing liquid, a caramelizing tank connected to receive said boiled-down liquid from said cooker, a stirrer in said caramelizing tank for stirring said boiled-down liquid to effect caramelization thereof, a variable speed motor connected to said stirrer to rotate said stirrer at selected speeds, control means for controlling the speed of said motor, a cooling tank connected to said caramelizing tank, means for pumping caramelizing liquid from said caramelizing tank to said cooling tank, means for measuring the level of liquid in said caramelizing tank, a caramelizing detector disposed adjacent said cooling tank in a position for detecting the caramelized liquid passed from said caramelizing tank to said cooling tank and connected to said means for pumping caramelized liquid from said caramelizing tank to said cooling tank for varying the speed of pumping thereof in accordance with the caramelization of the liquid.

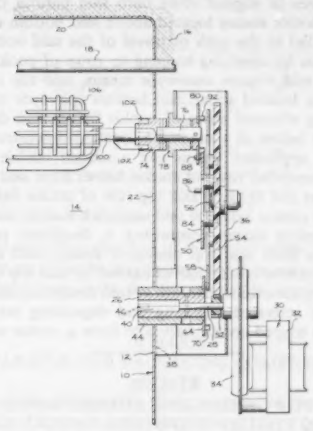
4,114,523

OSCILLATORY DRIVE MEANS FOR A ROTISSERIE SPIT

Christian A. Eff, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 5, 1976, Ser. No. 683,685
Int. Cl.[2] A47J 37/04
U.S. Cl. 99—393 5 Claims

1. A roasting oven comprising walls defining an oven cooking cavity, radiant heating means located adjacent the top wall of the oven cooking cavity, removable support means within the oven, a pair of spaced posts attached to the support means, a rotisserie spit supported adjacent its opposite ends from the said posts for pivotal movement with respect thereto, one vertical wall of the oven cooking cavity supporting a motor-drive mechanism having a chuck disposed closely adjacent the underside of the radiant heating means and adapted to be coupled with one end of the spit, said motor-drive mechanism having means causing the chuck to oscillate approximately 180°, a food-supporting basket fixed to the spit adjacent one side edge of the basket, the distance between said spit when coupled with said chuck and said underside of said radiant heating means being less than the radial distance from said spit to the side edge of said basket most remote from said spit, said basket being capable of swinging back and forth from a first horizontal position closely adjacent a portion of the radiant heating means, down and over to a second horizontal position closely adjacent another portion of said heating means so as to



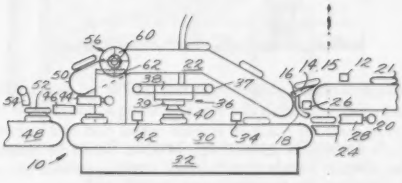
be able to broil both sides of the food supported in the basket in alternate steps until the food is cooked.

4,114,524

FILLER CAPPER MACHINE

Gray Gurney Welch, Winston-Salem, N.C., assignor to Royal Cake Company, Winston-Salem, N.C.

Filed Aug. 22, 1975, Ser. No. 606,931
Int. Cl.[2] A21C 15/00; B65G 57/00
U.S. Cl. 99—450.4 8 Claims



1. A sandwich making machine for receiving rows of cookie halves off of an infeed conveyor transporting the cookie halves away from a cookie oven and automatically making soft cookie sandwiches having filling material located between the two cookie halves comprising two conveyor means positioned one above the other to form a top conveyor means and a bottom conveyor means, a moveable bridge means comprising a moveable member positioned adjacent said top conveyor means adapted to be selectively moved in a plurality of alternating positions, one of said positions permitting the bridge means to move out of contact with a first row of cookies into an open position and another alternate position permitting said bridge means to receive the following row of cookie halves from said infeed conveyor and allow continuous movement of each subsequent alternate row of cookie halves to said top conveyor means from said infeed conveyor across said bridge means by utilizing the momentum of the cookie halves as they are discharged from the infeed conveyor, a cookie inverter means comprising a curved member positioned below said bridge member which said bottom conveyor means being positioned below said cookie inverter means, said top conveyor means being positioned substantially said bridge means, said bottom conveyor means providing transportion for rows of said inverted cookie halves through said machine, a cookie aligning means positioned adjacent said bottom conveyor means, said cookie aligning means being adapted to receive cookie halves

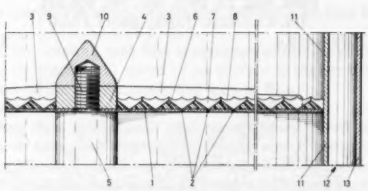
transported and inverted by said cookie inverter means when said bridge means is in the open position and feed said inverted cookie halves in aligned rows onto said bottom conveyor, filling applicator means located above said bottom conveyor means parallel to the path of travel of the said bottom conveyor means for applying topping to rows of cookie halves carried by said bottom conveyor means, said top conveyor means being located above said bottom conveyor means for transporting alternate rows of cookie halves and depositing said cookie halves at a sandwich location downstream from said filling applicator means and a second cookie aligning means for receiving rows of cookie halves from said top conveyor means and aligning said top row of cookie halves onto said bottom cookie halves at said sandwich station, said second cookie aligning means comprising a deadplate positioned downstream from said top conveyor means, said deadplate serving to receive cookie halves carried by said top conveyor and pusher plate means adjacent to said deadplate, said pusher plate when activated engaging and depositing said cookie halves onto topped cookie halves to form a cookie sandwich.

4,114,525

DEVICE FOR GENERATING SHEARING FORCES IN TREATING YOGURT AND OTHER VISCOUS LIQUIDS OR GELS

Frans M. Driessen, Bennekom; Jacob Ubbels, Ede, and Jacobus J. Stadhouders, Bennekom, all of Netherlands, assignors to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek, Ede, Netherlands

Filed Jan. 28, 1977, Ser. No. 763,549
Int. Cl.[2] A01J *11/00*
U.S. Cl. 99—465 **7 Claims**



1. A device for generating shearing forces in yogurt and other viscous liquids or gels being treated comprising:

a container for material being treated; and

a plate positioned in and movable with respect to said container and having an axis, a first end face, a second end face, and passageways defined therein and extending axially between said first and said second end faces, each of said passageways having a divergent end and a diverging portion extending over at least part of the length of the passageway and terminating at said divergent end, the divergent ends of each of said passageways intersecting with the divergent ends of adjacent passageways, said first end face being defined substantially by the intersecting divergent ends of said passageways.

4,114,526

APPARATUS FOR DENATURING FOOD PRODUCTS NOT INTENDED FOR HUMAN CONSUMPTION

Robert L. Soran, Modesto, Calif., assignor to Pet Foods, Modesto, Calif.

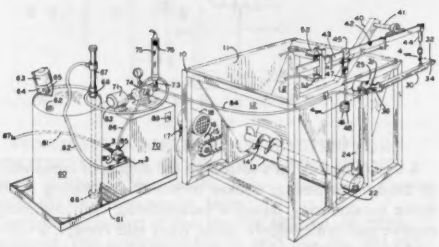
Filed Mar. 5, 1976, Ser. No. 664,149
Int. Cl.[2] A23L *1/275*
U.S. Cl. 99—533 **4 Claims**

2. An apparatus for denaturing comminuted flowable meat comprising:

(A) an elongated substantially straight tubular injector having opposite end portions;

(B) means connected to an end portion of the injector mounting the injector in a substantially horizontal position for elevational pivotal movement of the opposite end portion of the injector;

(C) scales connected to the injector intermediate tthe end portions thereof in resiliently supporting relation to said opposite end portion, said opposite end portion being supported in cantilever extension from the scales slidably to receive a sack in predetermined position in pendantly supported relation thereon with said opposite end portion of the injector within the sack, the opposite end portion of the injector having a closed pointed end to guide a sack slid thereon and a downwardly disposed port adjacent to the pointed end within the sack when the sack is in said predetermined position thereon;



(D) means for delivering comminuted flowable meat under pressure to the mounted end portion of the injector for extrusion therethrough into the sack;

(E) a duct having an outlet in fixed position within the injector adjacent to the port disposed in the direction of the extrusion of comminuted meat therepast;

(F) means for delivering dye under pressure to the duct, said injector being adapted to pivot downwardly against the supporting action of the scales when the sack and its contents reach a predetermined weight; and

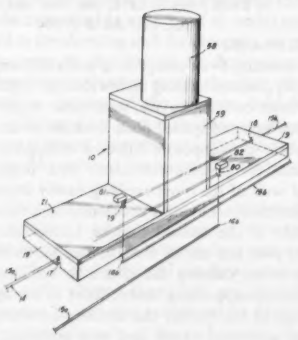
(G) means responsive to downward pivotal movement of the injector for interrupting operation of the meat delivering means and the dye delivering means when the injector pivots downwardly.

4,114,527

BALE TYING DEVICE AND KNOT PRODUCED THEREBY

Robert S. O'Neill, 7423 Sea View Pl., El Cerrito, Calif. 94530

Filed Sep. 9, 1977, Ser. No. 831,788
Int. Cl.[2] B65B *13/38*
U.S. Cl. 100—2 **13 Claims**

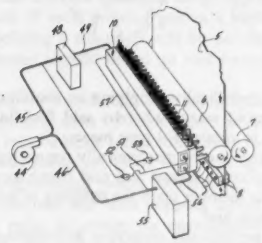


10. A method of forming a wire knot about a bale of material, comprising the steps of:

(a) passing wire about the exterior surface of said bale;

(b) aligning the distal portions of said wire in spaced, parallel relationship so that one of said distal portions extends past said other distal portion in the opposite direction;
(c) bending a section of each of said distal portions inwardly about a point adjacent the distal end of each of said portions towards the unbent distal portions, said distal ends passing beneath and through the vertical plane of said unbent wire portions, with the angle formed by each of the bent distal sections and its unbent distal portion being less than 90°; and
(d) folding inwardly of itself each of said distal sections which extends through each of said vertical planes about each unbent distal portion less than 360° but greater than 180° to form a knot having each of said distal ends angled downwardly and in engagement with said bale.

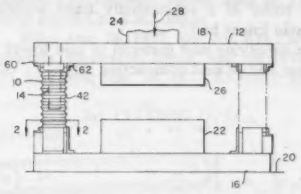
4,114,528
APPARATUS FOR WEB CALIPER CONTROL
Peter J. Walker, Pointe Claire, Canada, assignor to Midland-Ross Corporation, Cleveland, Mich.
Filed Mar. 2, 1976, Ser. No. 663,159
Int. Cl.[2] B30B *15/34, 3/04*
U.S. Cl. 100—47 **10 Claims**



1. Apparatus in combination with a plural-roll calender for adjusting the thickness of a web passing through the calender comprising:
separate header and source means for hot and cold fluids, and means for maintaining said fluids under uniform pressure and at predetermined respective hot and cold temperatures in respective header means;
a plurality of nozzle means in communication with the header means and spaced along a roll of the calender and oriented toward said roll to direct a mixture of said fluids against longitudinally spaced portions of the roll; and
separate valve means associated with each of the nozzle means for proportioning the flow of fluids from the headers for passage through the nozzles, each of the valve means including means which are movable, in unison, for increasing, by a certain amount, the volume of fluid flowing from one of the headers to an associated nozzle means while simultaneously decreasing, by the same amount, the volume of fluid flowing from the other of said headers to said associated nozzle means, so that the volume of fluid flowing from said nozzle means remains constant as the temperature of the fluid is varied.

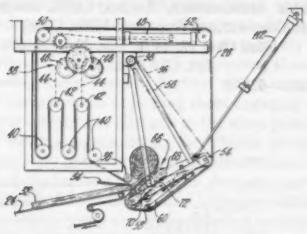
4,114,529
SAFETY STRUCTURE
Walter V. Furmaga, 14123 Barbara, Livonia, Mich. 48154
Filed Jan. 2, 1976, Ser. No. 646,143
Int. Cl.[2] F16P *1/00*
U.S. Cl. 100—53 **12 Claims**

1. In combination, a die set including an upper and lower platen, guide means on the upper and lower platen capable of damaging anything positioned therebetween on closing of the die set, and a guard sleeve including an elongated, accordion shaped, flexible plastic cylinder open to atmospheric pressure, and resilient means for laterally reinforcing the cylinder secured to the cylinder, positioned over the guide means, means securing one end of the sleeve to one platen of the die set and



means securing the other end of the sleeve to the other platen of the die set whereby placement of objects between portions of the guide means with the die set open is guarded against.

4,114,530
APPARATUS FOR PACKAGING COMPRESSIBLE STRIPS
Ward B. Miller, Waterville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Jun. 23, 1977, Ser. No. 809,214
Int. Cl.[2] B30B *5/04;* **B65H** *17/14;* **B65B** *63/04*
U.S. Cl. 100—87 **10 Claims**



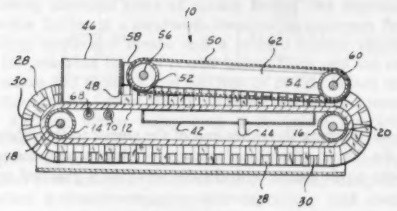
1. Apparatus for rolling and compressing a strip comprising a main endless belt, a portion of said belt defining a loop, means for placing said belt under tension to place the strip in compression as it is rolled in the loop, means for supporting a lower portion of said loop as the strip is rolled therein, said supporting means comprising a tail roll located below the loop, a drive roll spaced from said tail roll, and a plurality of supporting belts extending around said tail roll and said drive roll and having an upper run positioned to engage the lower portion of the loop, pinch roll means adjacent said tail roll for (1) pinching the main belt therebetween and (2) placing the upper run of the supporting belt in tension, said supporting belt being a timing belt with teeth on the inner surface thereof for engagement with correspondingly spaced grooves in said drive roll.

4,114,531
COMPACTING APPARATUS
Werner P. B. Plaut, Forest Hills, N.Y., assignor to Flexowall Corporation, Clinton, Conn.
Filed Jun. 2, 1976, Ser. No. 692,098
Int. Cl.[2] B30B *9/00, 9/24*
U.S. Cl. 100—90 **3 Claims**

1. Apparatus for compacting a flocculent solid material comprising:
an air-pervious lower conveyor belt;
a relatively air-impervious upper belt;
means for supporting said upper belt above said lower conveyor belt to form a convergent compacting zone having a convergent end and a divergent end, said supporting means including a first roller supporting said upper belt at the convergent end of said zone, a second roller support-

ing said upper belt at the divergent end of said zone, means mounting said first roller for vertical movement in the direction of said lower belt, and means mounting said second roller at a substantially fixed vertical position above said lower belt;

means for supplying said material to said lower belt at the divergent end of said compacting zone;



means for moving the opposing portions of said belts toward the convergent end of said compacting zone; and

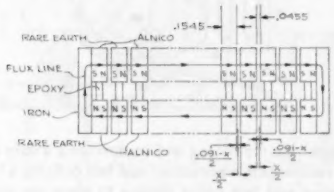
means including a suction device for withdrawing air from the compacting zone solely through the air-pervious lower belt.

4,114,532

IMPACT PRINTER MAGNET ASSEMBLY

Aram Sarkis Arzoumanian, Encino, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Oct. 12, 1976, Ser. No. 731,694
Int. Cl.[2] B41J *9/02*
U.S. Cl. 101—93.48 **9 Claims**



1. A magnet assembly comprising:

a plurality of substantially uniformly dimensioned magnetic members each having first and second pole faces and each being formed of substantially homogeneous material, said plurality of members being comprised of at least first and second groups having differing magnetic characteristics, said magnetic members of said first group comprising permanent magnets formed of a rare earth material and characterized by a maximum energy product in excess of 12 million gauss oersted;

said magnetic members of said second group being formed of soft iron; and

means supporting said members in alignment with members of said first and second groups interleaved and uniformly spaced from one another to define a gap between each pair of opposed pole faces for receiving a flat movable coil.

4,114,533

AUTOMATIC POSTAGE METER DATE SETTER

Lloyd G. Kittredge, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 11, 1977, Ser. No. 786,602
Int. Cl.[2] B41J *1/54*
U.S. Cl. 101—99 **6 Claims**

1. An apparatus for automatically setting the date of a postage meter, which meter has a gear that is part of a drive train for the postage meter print wheels and date indicator wheels, the combination comprising:

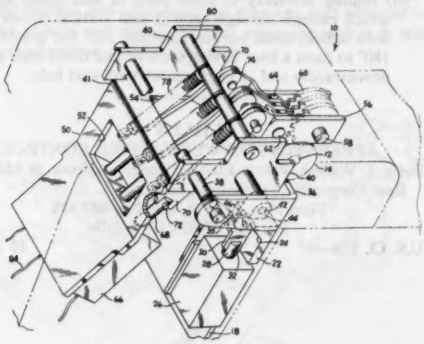
a housing;

first and second solenoid means received within said housing;

a frame member pivotably supported by said housing;

first linkage means supported within said housing and engaged by said first solenoid means;

gear means rotatably supported by said frame member and spaced relative to the drive train gear of the postage meter, said gear means being rotatably engaged by said linkage means;



means for periodically supplying an enabling pulse to said first solenoid means whereby said first linkage means is actuated to rotate said gear means;

second linkage means mechanically connected between said second solenoid means and said frame member to pivot said frame member upon the enabling of said second solenoid means; and

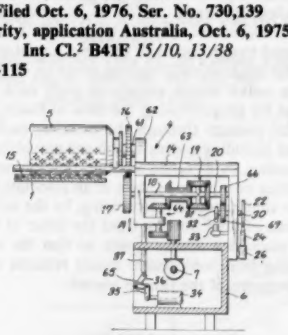
means for periodically supplying an enabling pulse to said second solenoid means whereby said gear means is placed into and out of engagement with the drive train gear.

4,114,534

CONTROL SYSTEM FOR ROTARY PRINTING SCREENS

Hans Kudlich, Kufstein, and Karl Schweitzer, Oberlangkampfen, both of, assignors to Maschinenfabrik Peter Zimmer Aktiengesellschaft, Kufstein, Austria

Filed Oct. 6, 1976, Ser. No. 730,139
Claims priority, application Australia, Oct. 6, 1975, 7646/75
Int. Cl.[2] B41F *15/10, 13/38*
U.S. Cl. 101—115 **14 Claims**



1. In a machine for printing a recurrent composite pattern on a substrate, comprising transport means for continuously advancing said substrate along a predetermined path and a set of cascaded printing units with rotary screens overlying said path, said set being divided into several groups for the printing of complementary portions of said pattern, each group including a plurality of printing units for the printing of different color components of the respective pattern portion, each printing unit being provided with a drive member for rotating the screen thereof at a peripheral velocity identical for all said

printing units and with an elevatable mounting having lifting means for raising said screen off said substrate during an idling phase of a printing cycle following a working phase, the combination therewith of:

transmission means linking said transport means with each drive member for correlating the substrate speed with said peripheral velocity, said transmission means including a speed changer adjustable to vary the ratio of said peripheral velocity to said substrate speed, said speed changer having an input shaft coupled with said transport means and an output shaft operatively connected with the drive members of all said printing units;

stop means individual to each printing unit for deactivating the drive member thereof to arrest the respective screen in said idling phase in a predetermined rotational position;

a first pulse generator coupled with said input shaft for producing a first pulse train having a cadence proportional to said substrate speed;

a second pulse generator coupled with said output shaft for producing a second pulse train having a cadence proportional to said peripheral velocity;

programming means connected to said second pulse generator and including a recording medium stepped by said second pulse train for operating said lifting means and said stop means of each printing unit in a predetermined sequence defining a printing cycle by periodically reading out command signals stored on said recording medium; and

timing means for distributing said command signals to the several printing units of each group at intervals determined by said substrate speed, said timing means including shift-register means provided with data inputs connected to said programming means for receiving said command signals therefrom and with stepping inputs connected to said first pulse generator for energization by said first pulse train, said shift-register means having different outputs respectively connected to all printing units following a first one of said printing units.

4,114,535

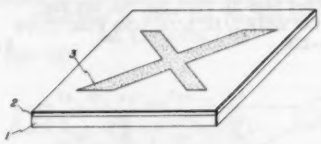
RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING

Narayan V. Deshpande, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 601,005, Aug. 1, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,715

Int. Cl.[2] B41F *7/00, 13/08;* **B41L** *17/02*

U.S. Cl. 101—141 **2 Claims**



1. In a direct printing process of transferring an inked image directly from the printing master to a receiver sheet, the improvement comprising employing a master consisting essentially of a suitable supporting substrate, and a resilient surface layer between 25 and 200 microns said surface layer having a Shore A durometer of between 30 and 80 and an image layer of up to 2.5 microns and supporting the receiver sheet by a resilient blanket having a Shore A durometer between about 70 and 90.

4,114,536

METHOD OF AND APPARATUS FOR TRANSFER PRINTING A TONER IMAGE

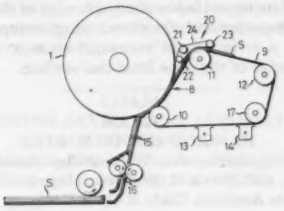
Yutaka Kaneko, and Tsutomu Ishida, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Japan

Filed Aug. 26, 1977, Ser. No. 828,220

Claims priority, application Japan, Aug. 26, 1976, 51-101983; Feb. 7, 1977, 52-11594; Mar. 23, 1977, 52-31853; Mar. 29, 1977, 52-35047

Int. Cl.[2] G03G *13/14*

U.S. Cl. 101—426 **6 Claims**



1. A toner image transfer printing method comprising the steps of feeding a recording sheet into intimate contact with a moving image-forming surface, carrying a toner particle image formed by developing an electrostatic latent image with a powder developer, for movement of the recording sheet with the image-forming surface; thereafter progressively engaging the outer surface of that portion of the recording sheet engaged with the moving image-forming surface with a transfer printing member having, on its recording sheet engaging surface, a dielectric layer electrically charged to the same polarity as the electrostatic latent image; utilizing the transfer printing member to progressively press the recording sheet against the moving image-forming surface with a low pressure; and progressively disengaging the recording sheet, together with the transfer printing member, from the image-forming surface with the toner particles on the image-forming surface being attracted to the recording sheet by the electrostatic force of the charged dielectric layer of the transfer printing member.

4,114,537

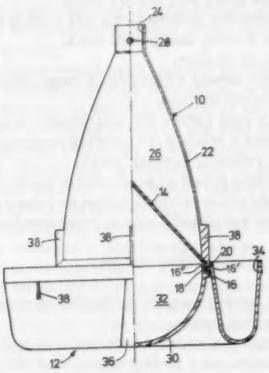
EXPLOSIVE DEVICE

Andrew James Brown, Five Oaks, Street Hey La., Willaston, Cheshire, England

Filed Oct. 18, 1976, Ser. No. 729,007

Int. Cl.[2] F42B *3/08*

U.S. Cl. 102—24 HC **19 Claims**



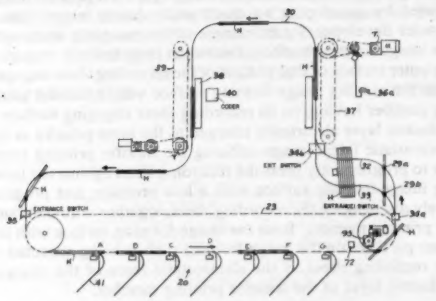
1. A trenching case comprising:

a. an outer casing; the outer casing comprising an upper casing part and a lower casing part;
b. a hollow cone fitting within the upper casing part, and
c. interengageable fastening means to enable the upper casing part and the lower casing part to be joined together to form the outer casing with the cone mounted between the upper and lower parts thereof to lie with the apex of the cone within the upper part of the casing to divide the interior of the casing into two separate compartments, a single piece annular ballast trough structure integrally formed with said lower casing part and surrounding the lower casing part, the lower casing part comprising a wall located to depend below the lower edge of the cone, when joined together with the outer casing, to support the case against a surface to be excavated so as to stand-off the lower edge of the cone from that surface.

4,114,538
HANGING GOODS SORTER

Robert N. Nicodemus, Jr., Walkersville; James W. Bosler, Frederick, and Marvin R. Kershner, Hagerstown, all of Md., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 630,193, Nov. 10, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,341
Int. Cl.² B61B *10/00*; B65G *17/32*
U.S. Cl. 104—88 **25 Claims**

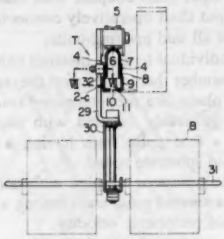


1. In a hanging goods sorter, the combination comprising
a power and free conveyor system including a power track,
a power conveyor movable along said track,
and a free track movable along a portion of said power track,
a gravity track connected at one end to said free track and at the other end to a spaced portion of said free track,
a loading station along said gravity track,
a coding station along said gravity track,
a plurality of delivery stations along said portion of said free track which is along said power track,
and a plurality of carriers,
each said carrier having a plurality of longitudinally spaced supporting hooks thereon,
means on each said carrier for individually actuating said hooks between a position for carrying hanging goods to a position for releasing hanging goods,
and means at fixed points adjacent said delivery stations for actuating said last-mentioned means to release said hanging goods on individual hooks at predetermined delivery stations,
coding means at said coding station,
a computer,
said computer having memory means for receiving a signal from said coding means,
and program means associated with said computer such that upon application of a coding signal, said computer will record said signal and, in turn, produce an appropriate release signal at the predetermined station to release the hanging goods from said carrier.

4,114,539
MEANS FOR TRANSFERRING, COLLECTING AND DISTRIBUTING TROLLEYS IN CONVEYER SYSTEM

Kohji Deno, Takatsukishi, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyotoshi, Japan

Filed Sep. 13, 1976, Ser. No. 723,018
Claims priority, application Japan, Dec. 11, 1975, 50-148023
Int. Cl.² B61B *12/02*
U.S. Cl. 104—165 **10 Claims**



1. Means for transferring, collecting and distributing trolleys in a conveyer system comprising a horizontal running rail which supports trolleys and on which trolleys run having a cross section having an upper downwardly opening U-shaped portion including a semi-circular connecting part and straight leg parts, portions extending away from each other connected to the free ends of the leg parts of the U-shaped portion of the rail cross section, then downwardly and then inwardly toward each other terminating in spaced apart relation, a running belt extending along one side of the running rail positioned adjacent the lower portion of one of the leg parts of the U-shaped portion of the running rail cross section and the portions extending away from each other connected thereto, means for driving the running belt and at least one trolley positioned on the running rail including an L-shaped arm, a roller and means for supporting the roller in engagement with the top of the running rail from the top of the L-shaped member, a pressing piece secured to the L-shaped member centrally thereof and in engagement with the running belt adapted to frictionally engage the running belt and press it against the running rail under pressure from a load positioned on the trolley, and including resilient means urging the pressing member toward the running belt, and load supporting structure secured to the lower portion of the L-shaped member.

4,114,540
RAILWAY TRUCK BOLSTER

Ronald T. Strugielski, Evanston, Ill., and Harry William Mulcahy, Griffith, Ind., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,599
Int. Cl.² B61F *1/12, 5/16, 5/50*; F16C *17/04*
U.S. Cl. 105—226 **5 Claims**

1. A truck bolster for a railway car truck having an elongated hollow compartmentalized body comprising,
a substantially rectilinear-shaped center cavity defined only by a substantially horizontal top member having a center plate formed on an upper surface thereof, a horizontal center portion of a bottom member spaced from said top member, and two spaced upwardly converging laterally

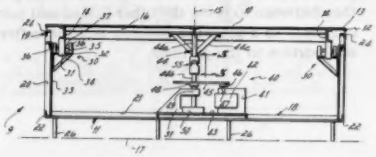
positioned ribs connecting said top and bottom members with an upper end of each of said ribs joining said top member beneath an outer rim of said center plate so as to provide clear passage through said center cavity below said center plate of said truck bolster.

4,114,541

ROTATING CAFETERIA TYPE FOOD SERVICE COUNTER WITH IMPROVED DRIVE SYSTEM

Elmer R. Weddendorf, Cincinnati, Ohio, assignor to B/W Metals Company, Inc., Fairfield, Ohio

Filed Jun. 23, 1977, Ser. No. 809,288
Int. Cl.[2] B01D *33/00*
U.S. Cl. 108—20 **3 Claims**



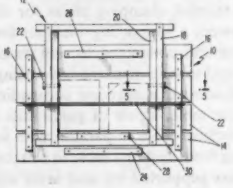
1. A cafeteria type food service counter comprising
a generally circular counter top,
an immobile support frame having a plurality of idler rollers mounted thereon, said idler rollers being adapted to cooperate with said counter top to support said counter top for rotation relative to said support frame,
a primary drive shaft having an upper section and a lower section, said upper section being fixed to the underside of said counter top in coaxial fashion relative to the rotation axis of said counter top,
drive means connected with said lower section of said primary drive shaft, and
a universal joint connecting said upper section and said lower section of said primary drive shaft, said universal joint serving to transmit rotation from said primary drive shaft's lower section to said primary drive shaft's upper section for rotating said counter top, said universal joint also serving to permit limited tilting or flexing of said counter top relative to the horizontal, and said universal joint cooperating with said idler roller support of said counter top for minimizing significant vibration of the counter top during rotation thereof by allowing said counter top to flex or tilt slightly if required relative to its rotation axis to maintain supportive contact with said idler rollers.

4,114,542

PORTABLE, COLLAPSIBLE FURNITURE

D. G. Fentress, P.O. Box 6102, Clearwater, Fla. 33518

Filed May 25, 1977, Ser. No. 800,396
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—157 **10 Claims**



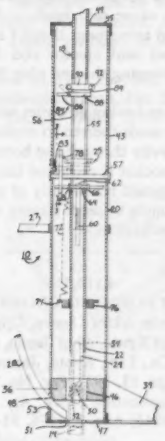
1. A portable, collapsible piece of furniture, said furniture comprising:
(a) an at least generally planar support surface;
(b) a legs subassembly;
(b_1) said support surface comprising at least two pairs of spaced braces mounted on the underside of said support surface, said pairs of braces being substantially perpendicular to each other and also serving as stops limiting the movement of said legs subassembly in both its opened and collapsed positions, said legs subassembly lying substantially between said pairs of braces and parallel thereto in said collapsed position;
(c) means for releasably attaching said legs subassembly when in its opened position to said support surface; and
(d) means for releasably attaching said legs subassembly when in its collapsed position to said support surface such that said subassembly can function conveniently as a handle for carrying said piece of furniture.

4,114,543

SEED PLANTING DEVICE WITH AUTOMATIC SEED COVERING

Roderick A. Mitchell, 5042 N. Winthrop, Chicago, Ill. 60640

Filed Jul. 2, 1976, Ser. No. 702,241
Int. Cl.[2] A01C *5/02, 7/02*
U.S. Cl. 111—96 **7 Claims**



1. A device for planting seeds, comprising:
an elongated tubular housing having a hollow interior and having openings in the top and bottom ends of said housing;
a concentrically-disposed axially-aligned elongated rigid member reciprocably mounted within the hollow interior of said housing;
a tubular socket connected to the end portion of said member for extending through the opening in the bottom end of said housing to dig into the soil to be planted and to withdraw a soil plug to leave a soil hole in the soil;
a handle portion connected to said member for extending through the opening in the top end of said housing to enable said member to be moved axially relative to said housing toward its bottom end so that said socket can be forced into digging engagement with the soil and then the member retracted in said housing whereby a seed can be dropped in the soil hole;
backfilling means for moving soil into the soil hole for covering the seed therein, said backfilling means including a slidably mounted ejector rod having a bottom end portion for moving into said socket for ejecting the soil plug from said socket into the soil hole to cover over the seed;
spring means stretched between said rod and said elongated rigid member for propelling said rod into said socket to discharge the soil plug therefrom;

means defining an elongated slot in said rigid member;

rod means connected fixedly to said ejector rod and extending transversely therefrom and through said slot terminating at its outer distal end within the interior of said housing;

a latch mounted within said housing for engaging releasably said rod means of said ejector rod as said rigid member moves toward the bottom end of said housing to stretch said spring means between said rigid member and said ejector rod, said latch having at its lower end portion hooking means for holding said rod means and thereby said ejector rod and having at its upper end portion camming means;

releasing means mounted on said rigid member and having a pivotally mounted pin means extending transversely from said rigid member to engage said camming means during the downward movement of said rigid member and to pivot rearwardly away from said camming member to enable said pin means to move forwardly to a position below said camming means, said releasing means further including rigid means for limiting the forward pivotal movement of said pin means so that, when said rigid member commences its rearward upper movement to carry said pin means from said position below said camming means, said pin means engages and moves said camming means to cause said latch to free said rod means during rearward movement thereof to permit said spring means to propel said ejector rod forwardly into said socket for discharging the soil plug from said socket into the soil hole;

seed delivery means having an outlet near said bottom opening for guiding seeds thereto to enable them to fall under the force of gravity through the bottom opening into the hole after said socket is retracted into said housing; and

a seed hopper disposed rearwardly of said bottom end portion storing a supply of seeds having an outlet supplying a seed feeding mechanism.

4,114,544

APPARATUS FOR FORMING LOOPS ON A GARMENT

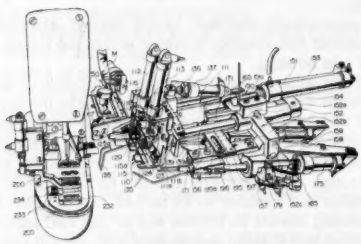
Nobuji Miyachi, Kyoto; Akira Ogawa, Uji; Keniti Miyake, and Isao Onishi, both of Kyoto, all of Japan, assignors to Miyachi Sewing Machine Co., Ltd., Kyoto, Japan

Filed Apr. 11, 1977, Ser. No. 786,141

Claims priority, application Japan, Apr. 20, 1976, 51-45262; May 20, 1976, 51-58815; Aug. 3, 1976, 51-104136[U]; Nov. 19, 1976, 51-139897

Int. Cl.[2] D05B *3/12*

U.S. Cl. 112—104 **10 Claims**



1. An apparatus for forming loops on a garment comprising:

delivery means for sending out an elongated material, said delivery means being provided with means for detecting a seam portion and means for removing a cut piece including a seam portion in response to a signal from the detecting means,

means for fastening the sent out material on at least one receiving plate,

two clamp means provided on the opposite sides of the receiving plate respectively for clamping the fastened material at its opposite ends,

a cutter for cutting the fastened material,

a cycle sewing machine, and

transfer means for simultaneously moving the two clamp means toward and away from the cycle sewing machine, each of the clamp means having two fingers for folding an end portion of the material in nipping engagement therewith and clamping the same,

the cycle sewing machine having a front presser foot, a rear presser foot and a cloth retaining presser plate formed with openings opposed to the presser feet respectively, the presser feet and the presser plate being movable, whereby after one folded end portion of a cut piece of the material is stitched to the garment, the presser feet and the presser plate are moved with the cut piece and the garment held therebetween to bring the other folded end portion of the cut piece to a stitching position and thereafter stitch the end portion to the garment.

4,114,545

AUTOMATIC SEWING MACHINES

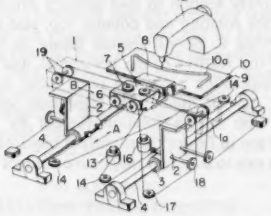
Takao Manabe, Shizuoka, and Sigetugu Matunaga, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1977, Ser. No. 786,035

Claims priority, application Japan, Apr. 15, 1976, 51-42652

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.15 **2 Claims**

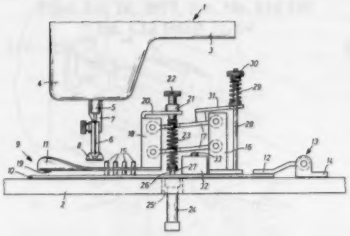


1. An automatic sewing machine comprising a sewing machine table, a first hollow table mounted above said sewing machine table and provided with an opening at the bottom thereof and pulleys on the opposite ends thereof, a second table contained in said first table and movable in the axial direction thereof said second table being provided with pulleys on the upper surface thereof, clamping plates for clamping pieces of cloth to be sewed, a supporting member for supporting said clamping plates and connected to said second table through said opening, said sewing machine table being provided with a pair of slits extending in a direction perpendicular to the axis of said first hollow table, a pair of guide rails disposed beneath said sewing machine table in parallel with said slits, a pair of arms depending from said first table to be received by said slits, sliding members supported by said arms and guided by said guide rails, a pair of motors mounted on a stationary portion of said sewing machine table, and belts passing about said pulleys of said first and second tables for driving said first and second tables, respectively by said motors.

4,114,546
SEWING MACHINE WITH A WORKPIECE GUIDE MECHANISM

Otto Kirch, Mehlingen, and Erich Willenbacher, Rheinstetten, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Oct. 31, 1977, Ser. No. 846,991
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 7713701
Int. Cl.[2] D05B *35/10*
U.S. Cl. 112—153 2 Claims

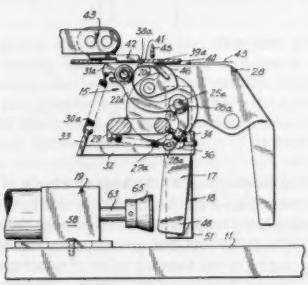


1. A sewing machine for producing edge parallel seams in workpieces of any contour, wherein the sewing machine includes a needle which is reciprocable in a stitch forming area, comprising a workpiece ruler guide extending laterally of the stitch forming area and at an angle to a line passing through the needle axis, a workpiece guide mechanism including upper and lower guide plates forming a workpiece passage space therebetween disposed alongside said ruler, means mounting said upper plate over said lower plate for upward and downward movement relative to said lower plate, a pressure spring having one end acting on said upper plate and having an opposite spring end, a tension member engageable with said opposite spring end, means for moving said tension member in one direction to stretch said pressure spring and increase the tension acting on said spring and to lower said upper plate against the workpiece to produce a braking effect on the workpiece, said tension member being movable in an opposite direction to a rest position to decrease the tension on said pressure spring, and a lifting spring acting on said upper plate producing an upward lifting force thereon of a magnitude to lift the said upper plate when said tension member is in a rest position and the tension on said pressure spring is reduced.

4,114,547
STITCH SHORTENING AND TACKING ASSEMBLY

Richard Russell, Tappan, N.Y., assignor to U.S. Blind Stitch Machine Corp., Plainview, N.Y.

Filed Sep. 23, 1977, Ser. No. 836,253
Int. Cl.[2] D05B *1/24, 27/22*
U.S. Cl. 112—178 16 Claims

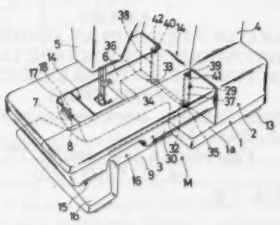


1. A variable stitching assembly for use with a sewing machine including a platen disposed in a first position for supporting a fabric during a sewing operation, a feeder constructed and arranged to be reciprocated through a feeding stroke, said feeder being adapted to engage said fabric against said platen when said platen is in said first position and said feeder is reciprocated through a feeding stroke to thereby advance said fabric through a first predetermined distance, needle means synchronized with respect to said feeder for stitching the fabric at the completion of each feeding stroke of said feeder, the improvement comprising a rib for lifting and selectively feeding arranged to be reciprocated in synchronism with said needle means through a lift stroke that is shorter than the feed stroke of said feeder, said rib being arranged to lift said web during said lift stroke, and first platen displacement means coupled to said platen for displacing same from said first position to a stitch shortening position out of engagement with said feeder during said feed stroke thereof so that said fabric is advanced by said rib during said lift stroke thereof a shorter distance than said first predetermined distance, thereby shortening the length of the stitch effected by said sewing operation.

4,114,548
SEWING MACHINE WITH BASE EXTENSION

Takahiko Kasahara; Shigeharu Shichi, both of Anjo; Hideo Banno, Nagoya; Senji Suito, Kariya, and Masayuki Kato, Owariasahi, all of Japan, assignors to Aisin Seiki Company, Limited, Japan

Filed Jun. 20, 1977, Ser. No. 808,088
Claims priority, application Japan, Jun. 25, 1976, 51-84184[U]
Int. Cl.[2] D05B *73/06*
U.S. Cl. 112—258 5 Claims

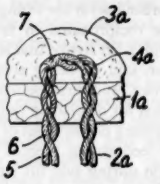


1. A sewing machine comprising:
a base plate substantially of H-shape and having a concavity at the central transverse bar portion thereof;
a standard vertically supported upon one side bar portion of said H-shaped base plate;
a cylindrical base extending horizontally from said standard, the under surface of said base facing said transverse bar portion of said base plate;
a base extension substantially of C-shape and hinged to said cylindrical base;
said base extension being movable between a first position where the upper surface thereof is coplanar with that of said cylindrical base and a second position where the under surface thereof is coplanar with that of said H-shaped base plate;
a locking means normally maintaining said base extension at said first position including an inward projection provided on an inner wall at an end of said base extension and a groove member provided on a side wall of a free end of said cylindrical base such that said inward projection is lockably engageable with said groove member
said cylindrical base being received in a central recess of said C-shaped base extension at said first position thereof; and
said base extension having a recess at the underside thereof for accommodating the other side bar portion of said H-shaped base plate at the second position of said base extension.

4,114,549
PILE FABRIC

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Jun. 7, 1977, Ser. No. 804,307
Int. Cl.[2] D02G 3/26; D05C 17/02
U.S. Cl. 112—410 9 Claims

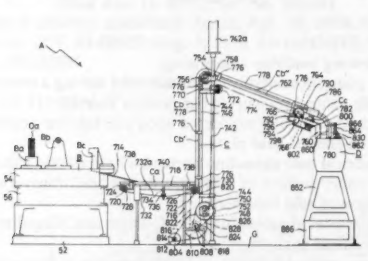


1. A pile fabric comprising a backing and a plurality of tufts protruding from said backing, a selected proportion of said tufts consisting of self-twist plied yarn, said self-twist plied yarn consisting of a plurality of false twisted singles yarns, each singles yarn having a repeating pattern along its length of S twist and Z twist and nodes therebetween, said singled yarns being fastened together at said nodes and having the same direction of twist between said nodes, said self-twisted plied yarn being self-twisted in opposite directions to said singles yarns, and the remainder of said tufts consisting of substantially untwisted singles yarn in unplied yarn.

4,114,550
APPARATUS FOR USE IN AN AUTOMATIC AND CONTINUOUS MANUFACTURE LINE FOR MANUFACTURING THE OUTER CYLINDRICAL CASES OF DRY CELLS

Kozo Ohkawa, Kawasaki, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,182
Int. Cl.[2] B21D 51/20
U.S. Cl. 113—7 R 23 Claims

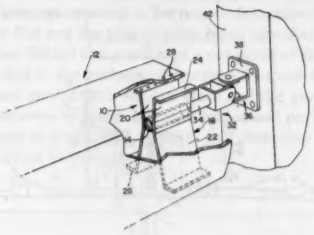


1. Apparatus for use in an automatic and continuous manufacture line for manufacturing the outer cylindrical cases of dry cells from blanks comprising a stacking station having stacking means for stacking said blanks, a pre-forming station having a pre-curling means for forming an arc-shaped pre-curl on said blanks, a first carrying means for receiving the blanks from the stacking means and moving the blanks through said pre-curling means, a forming station having forming means for forming the pre-curled blanks into cylindrical bodies, a second carrying means for moving the blanks to the forming station, line conveyors conveying the formed cylindrical bodies from the forming station, a rotary flanger means to which the formed cylindrical bodies are conveyed by the line conveyors, and pressing means on said rotary flanger for pressing both ends of the cylindrical bodies in such a manner that only one longitudinal end of the cylindrical body is inwardly bent to form a flange.

4,114,551
GOOSE-NECK FITTING

Eric R. D. Hall, Marion, Mass., assignor to Schaefer Marine Products, New Bedford, Mass.

Filed Jan. 6, 1978, Ser. No. 867,384
Int. Cl.[2] B63H 9/04
U.S. Cl. 114—98 5 Claims

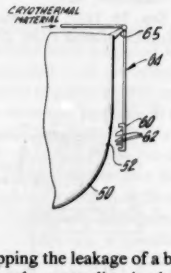


1. A goose-neck connector assembly for removably connecting the end of an elongated member to a boat mast comprising
A. an elongated connector member positioned inside the hollow end of the elongated member with its axis parallel to that of the elongated member;
B. a pair of struts positioned in the elongated member on opposite sides of the connector member and extending between opposite walls of the elongated member said connector member and struts in section having the general shape of the letter H;
C. means for securing said struts to said connector member; and
D. means for securing the ends of said struts adjacent said walls to said walls so that the connector member and struts form a stiffening truss at the end of the elongated member.

4,114,552
CRYOTHERMAL MANIPULATION OF PETROLEUM

Sigmund Lance Ross, 1280 E. 53rd St., Brooklyn, N.Y. 11234; Oscar Shuffman, deceased, late of Scarsdale, N.Y., and by Rose Shuffman, executrix, 1 Cornell, Scarsdale, N.Y. 10583

Division of Ser. No. 246,960, Apr. 24, 1972, Pat. No. 4,031,707.
This application Jan. 26, 1977, Ser. No. 762,659
Int. Cl.[2] B63B 43/16; F25D 3/00
U.S. Cl. 114—227 4 Claims



1. A method for stopping the leakage of a body of petroleum through a crack above the water-line in the hull of a vessel containing said body of petroleum comprising the steps of:
providing a mass of material at a cryothermal temperature corresponding to the freezing point of water at sea level or lower, which cryothermal temperature is lower than the temperature of said body of petroleum; and
positioning said mass of material adjacent said crack in the

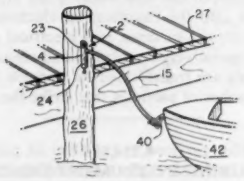
vessel for direct contact with petroleum seeping through said crack and with the ship hull immediately adjacent said crack so as to increase the surface tension of petroleum seeping through said crack and ultimately solidify said petroleum seeping through said crack thereby forming a plug for preventing the leakage of petroleum through said crack.

4,114,553

MOORING DEVICE AND CLEAT

Charles E. Zidek, 9851 Robin Rd., Niles, Ill. 60648

Filed Jul. 18, 1977, Ser. No. 816,349
Int. Cl.[2] B63B *21/04*
U.S. Cl. 114—230 **8 Claims**



1. A mooring device comprising a tubular member having a bore and at least one open end,

means for securing the device to an associated support,

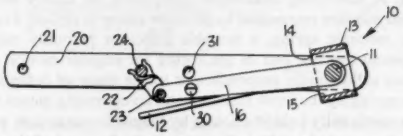
means providing a keyhole slot open at one end through said one end of said tube for admitting a mooring cable therethrough, said cable having an enlargement at its free end for preventing endwise movement of the cable out of the slot, and said tube having an edge at said one end extending diagonally of the axis of the bore away from the support and providing an enlarged open end for the bore to facilitate entry of said cable enlargement into the bore.

4,114,554

ANCHOR HAVING BUILT-IN TRIP DEVICE

Frank Miller, 23 King George Av., Brighton North, South Australia, Australia

Filed Apr. 22, 1977, Ser. No. 789,868
Int. Cl.[2] B63B *21/44*
U.S. Cl. 114—298 **4 Claims**



1. An anchor having a cross-bar, abutment plates on the cross-bar having abutment surfaces, a primary arm, pivot means pivoting the primary arm for pivotal movement with respect to the cross-bar to be movable between and engageable against said abutment surfaces, a secondary arm, pivot means also pivoting the secondary arm at one of its ends for pivotal movement with respect to the cross-bar, said secondary arm not being engageable against said abutment plates, anchor cable attachment means at the other end of the secondary arm, anchor flukes on the cross-bar, and pressure releasable latch means between the primary and secondary arms, said latch means comprising:

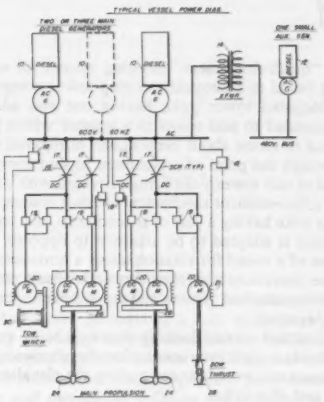
a link, a pivot pin joining one end of the link to the swinging end of the primary arm, the other end of the link being bifurcate and comprising a pair of spaced resilient arms, and a pin in the secondary arm engaged by the resilient arms of the link but releasable therefrom on the application of force separating the primary and secondary arms.

4,114,555

APPARATUS FOR AND METHOD OF INTERCONNECTING AND CONTROLLING UNITS OF A POWER TRAIN FOR MAXIMUM FLEXIBILITY AND ECONOMY IN OPERATING AUXILLIARY MARINE VESSELS

Harry W. O'Brien, Jr., 203 Carondelet St., New Orleans, La. 70130

Filed Mar. 14, 1977, Ser. No. 777,184
Int. Cl.[2] B63H *21/12*
U.S. Cl. 115—76 **5 Claims**



1. Apparatus for interconnecting and controlling units of a power train for maximum flexibility and economy in the operation of auxiliary marine vessels having propellers and propeller shafts driven thereby, and comprising in combination:

a. a plurality of power producing unit means connected in parallel, and each comprisng electrical generating means for producing a constant voltage and frequency AC, and diesel engine means for producing maximum torque and brake horsepower at maximum rated rpms and minimum fuel consumption per brake horsepower hour for driving said electrical generating means;

b. a plurality of power control unit means connected in parallel with each other and respectively in series with said power producing unit means and comprising a plurality of silicon control rectifier means for rectifying and voltage controlling a constant voltage and frequency AC output of said electrical generating means into variable voltage DC, and a plurality of electrical current control means connected in parallel with each other and in series with said electrical generating means for rectifying and varying the current; and

c. a plurality of power using unit means comprising a plurality of shunt wound DC motor means having rotor coils and field coils, said rotor coils for connecting together in parallel, and to the silicon control rectifier means in series combination with said power producing unit means for activation and control of varying speeds of said DC motor means below 100% and less of base rpms thereof, said field coils being connected in series through said electrical current control means with said electrical generating means and in parallel with each other for activating said DC motor means in combination with said silicon control rectifier means and controlling said varying speeds above said 100% of base rpms of said DC motor means.

4,114,556

RIGID MOORING ARM HOOK-UP SYSTEM

James A. Orndorff, Jr., Glen Ellyn; Robert S. Wozniak, Elmhurst, and John S. Andrepont, Lisle, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jun. 13, 1977, Ser. No. 805,652

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **4 Claims**

1. A "quick-disconnect" mooring system for connecting a floating vessel to a buoyant mooring tower comprising:

an elongated tower yoke having one end adapted to be connected to said tower in a manner which permits said yoke to rotate about vertical and horizontal axes passing through the point of attachment to said tower, the other end of said tower yoke being provided with a first element of a two-element mechanical locking system;

a ship yoke having a pair of spaced arms, one end of each of which is adapted to be attached to opposite sides of the bow of a vessel for rotation about a horizontal axis, and a base interconnecting the other ends of said arms, said base having attached thereto the second element of said locking system;

said first and second locking elements being engageable to provide a rigid interconnection therebetween;

means on said vessel for controlling the elevation of the base of said ship yoke;

an elongated flexible cable having one end attached to said first locking element and the other end operatively attached to a take-up system located on said vessel;

means on said ship yoke engaging said cable for aligning said cable and said yoke when said cable is taut;

whereby the two elements of said locking assembly can be brought into aligned operative engaging relationship by taking up said cable in a taut condition.

4,114,557

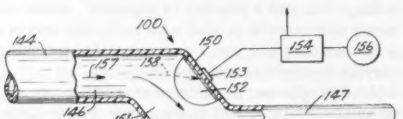
PARTICLE MONITORING SYSTEM

Robert J. De Brey, 1830 E. 42nd St., Minneapolis, Minn.

Division of Ser. No. 268,020, Jun. 30, 1972, Pat. No. 3,989,311, which is a continuation-in-part of Ser. No. 37,157, May 14, 1970, Pat. No. 3,674,316. This application Oct. 28, 1976, Ser. No. 736,467

Int. Cl.[2] G08B *21/00*

U.S. Cl. 116—67 R **10 Claims**



1. A particle monitoring apparatus for sensing particles in a flowing fluid comprising: first means having a first passage for carrying air and particles, second means having a second passage for carrying air and particles, said second passage being substantially parallel to and offset from the first passage, a housing connecting the first means with the second means, said housing having a chamber in communication with the first passage and second passage and a wall facing the chamber, said wall connecting the first means with the second means and having an angled portion located in general alignment with the longitudinal axis of the first passage, said chamber having a cross sectional area larger than the cross sectional area of either the first or second passage, a particle sensor mounted on said angled portion of said wall, said sensor located in alignment with the first passage so that the particles moving from the first passage are directed toward the sensor, said sensor operable to detect particles that strike the sensor and establish electrical signals related to the number of particles that strike the sensor, said sensor comprising a piezoelectric crystal having a surface exposed to the chamber upon which the particles impinge, said crystal being mounted on the angled portion of said wall and having a shape that conforms to the general shape of the inside of the wall whereby the crystal has a minimum extension into the chamber, an electronic circuit connected to the crystal to sense said electrical signals, and an output device operatively coupled to said circuit whereby said electrical signals are transformed to readable information related to the number of particles that strike the crystal.

4,114,558

MEASURING INSTRUMENT INDICATING MECHANISM

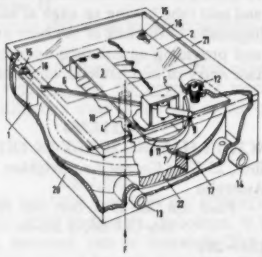
Peter Edward Bagley, Bix. Nr. Henley-on-Thames, England, assignor to Airflow Developments Limited, England

Filed May 10, 1977, Ser. No. 795,608

Claims priority, application United Kingdom, Apr. 26, 1977, 17387/77

Int. Cl.[2] G01D *13/00;* **G01L** *19/10*

U.S. Cl. 116—114 PV **9 Claims**



1. A measuring instrument comprising an axially movable input member responsive to pressure acting to deflect a cantilever mounted spring, a movable indicator pivotally mounted adjacent the free end of the spring for angular motion in the plane substantially perpendicular to the plane of deflection of the spring by the input member, and co-operating means which are continually held in contact by magnetic attraction, respectively mounted on the indicator and the free end of the spring for converting deflection motion of the spring into the pivoted motion of the indicator.

4,114,559

TEMPERATURE MONITORING

Neil E. Rogen, Upper Saddle River, N.J., assignor to Nicoa Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 508,224, Sep. 23, 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,505

Int. Cl.[2] G01K *11/00*

U.S. Cl. 116—114.5 **11 Claims**

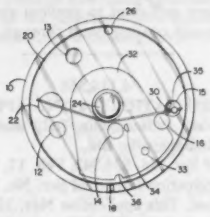
1. Temperature monitoring device indicating thermal history comprising,

means defining opposing first and second relatively fixed and movable subassemblies, respectively,

means defining a material having a first configuration above

a transition temperature which is formable into a second configuration below said temperature and having the capability of changing sharply from said second configuration to said first configuration at the transition temperature,

said material being connected between said first and second subassemblies for working from said first configuration to said second configuration by relative movement of said subassemblies,



means defining an indicator of working said material from said first to said second configuration and means for locking said indicator in position, and

means defining an indicator of return of said material from its second configuration to its first configuration if the transition temperature is reached, and

wherein the fixed subassembly is bondable to an item whose thermal history is to be monitored and comprises fixed position markers therein and said movable subassembly comprises window means alignable with said markers to constitute said indicator of working said material.

4,114,560

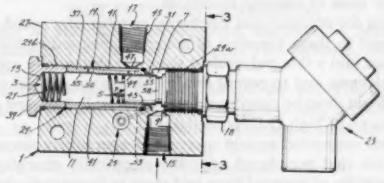
FLOW SENSOR

Jerome B. Wegmann, St. Louis, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed May 18, 1977, Ser. No. 797,932

Int. Cl.[2] F16N *29/00*; G01F *15/06*

U.S. Cl. 116—117 R **10 Claims**



1. A flow sensor for sensing failure of flow of a fluid such as lubricant comprising a body having a cylinder therein closed at its ends, a piston slidable axially in the cylinder dividing the cylinder into a first chamber between the piston and a first end of the cylinder and a second chamber between the piston and the second end of the cylinder, said body having an inlet for delivery of the fluid under pressure to the first chamber, an outlet located between the inlet and the second end of the cylinder interconnected with the second chamber, the piston being movable away from a no-flow position adjacent the first end of the cylinder wherein it blocks the outlet from the inlet to a flow-through position wherein it unblocks the outlet from the inlet for flow of the fluid from the inlet to and out through the outlet, spring means biasing the piston to its no-flow position, the piston being movable against the bias by the pressure of the fluid in the first chamber to its flow-through position, and means for signalling when the piston is in its no-flow position, wherein the improvement comprises the provision in said body of an adjustable bleed passage means interconnecting the first and the second chambers for passage of fluid from the first chamber to the second chamber at a controlled rate when flow ceases and the spring means moves the piston to its no-flow position to retard the movement of the piston.

4,114,561

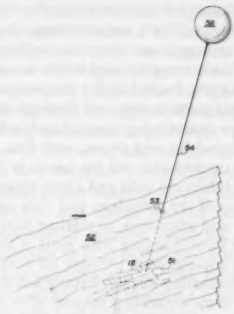
AVALANCHE RESCUE MARKER SYSTEM

Vito F. Asaro, 600 B St., #600, San Diego, Calif. 92101

Filed Oct. 15, 1975, Ser. No. 622,473

Int. Cl.[2] B64B *1/52*

U.S. Cl. 116—124 B **2 Claims**



1. A rescue marker system comprising:

An instantly openable pack assembly being carried on the back of an outer garment of a user, said openable pack assembly including an inflatable marker balloon, and a tether coupled to a neck portion of said marker balloon on one end thereof and to the openable pack assembly on another end thereof; an inflation assembly being carried on an upper front portion of said user's outer garment, said inflation assembly including a gas cylinder having compressed lighter-than-air gas therein, and a manually operated lever for activating puncturing means which means is operable for instant, one movement puncturing of said gas cartridge and inflation of said balloon; release means for automatically and instantly releasing said marker balloon after inflation thereof; and sealing means for sealing the lighter-than-air gas into said balloon upon release thereof.

4,114,562

IMPREGNATION FURNACES FOR CARBON ARTICLES

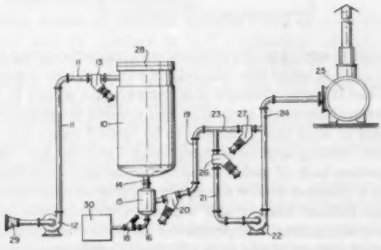
Luciano Ubaldi, Rome, and Osvaldo Buccella, Terni, both of Italy, assignors to Elettrocarbonium S.p.A., Milan, Italy

Filed Apr. 7, 1977, Ser. No. 785,560

Claims priority, application Italy, Apr. 14, 1976, 49036 A/76

Int. Cl.[2] B05C *3/09, 9/08*

U.S. Cl. 118—50 **2 Claims**



1. In combination with an impregnation furnace for carbon articles making use of impregnants, comprising an autoclave in

which the impregnation process takes place, the autoclave being closed by a cover, an apparatus for completely drawing the smoke developed during the impregnation process including: fan means adapted to draw atmospheric air and connected to the upper portion of said autoclave by means of a first pipe; first valve means controlling said first pipe; a drop separating means connected to the bottom of said autoclave through a short length of tube, and to the impregnant supplying source through a second pipe, controlled by a second valve means, said drop separating means being provided with a third pipe which is controlled by a third valve means; drawing means provided with an inlet pipe, controlled by a fourth valve means and connected to said third pipe and a fourth pipe connected to said third pipe, through a tube controlled by fifth valve means and directly connected to a smoke eliminating device; these parts being so arranged as, once the impregnation process under pressure has been performed in the autoclave, owing to said impregnant being heated to the temperature of maximum fluidity, said impregnant is removed through said second pipe, said second valve means being opened and, while maintaining the autoclave closed by said cover, said first, third and fifth valve means are opened and said fan means is operated, which blows a flow of relatively cold and clean atmospheric air into the upper portion of the autoclave and then onto the impregnated articles in said autoclave, in relative heat exchange relationship, said air flow charging with most of the smoke developed during the impregnation process; air flow being then fed to said smoke eliminating device, having left the largest particles inside said drop separating means; after a suitable time, said fan means is stopped, said first and fifth valve means are closed and said fourth valve means is opened, while operating said drawing means and, simultaneously, slowly removing said autoclave cover, while the residual smoke is drawn towards the autoclave bottom through the drop separating means and then sent to said smoke eliminating device as well.

4,114,563

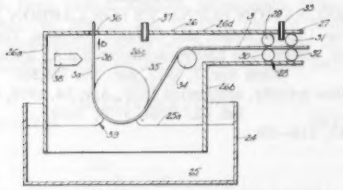
APPARATUS FOR CONTINUOUSLY CONTACT-COATING ONE SIDE ONLY OF A FERROUS BASE METAL STRIP WITH MOLTEN COATING METAL

Paul E. Schnedler, Middletown; Marvin B. Pierson, Franklin; Hart F. Graff, Middletown; Thomas A. Compton, Middletown, and William R. Leasure, Middletown, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 668,241, Mar. 18, 1976, Pat. No. 4,082,868. This application Jan. 3, 1977, Ser. No. 756,333

Int. Cl.[2] B05C *3/18, 11/06*

U.S. Cl. 118—63 **37 Claims**



1. Coating apparatus for continuously contact-coating with a molten coating metal one side only of a ferrous base metal strip which has traveled through strip preparation means to bring said ferrous base metal strip to proper coating temperature and to render at least said strip side to be coated clean and oxide free, said coating apparatus comprising a coating pot containing a molten bath of said coating metal, means to conduct said strip to a position above the upper surface of said bath such that the surface tension and wetting characteristics of said molten coating metal will permit the formation of a meniscus at said upper surface of said bath which will continuously contact and coat that one side only of said strip facing said bath, finishing means to remove excess coating metal from said coated side of said strip while said coating metal is still molten thereon and means to maintain said strip in a protective, non-oxidizing atmosphere from said strip preparation apparatus at least until said one side of said strip has been initially contacted by said meniscus, said last mentioned means comprising a coating hood connected to said strip preparation means, said coating hood having a top and front, rear and side walls surrounding said strip conducting means, said coating hood walls extending downwardly into said bath, said coating hood having an exit for said ferrous base metal strip, means for introducing said protective, non-oxidizing atmosphere into said coating hood at a positive pressure sufficient to prevent entrance of ambient atmosphere into said coating hood through said exit.

4,114,564

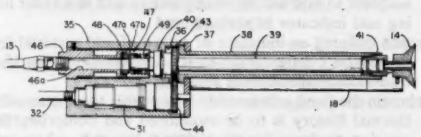
ELECTROSTATIC COATING APPARATUS

Richard O. Probst, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 534,942, Feb. 17, 1966, abandoned, which is a continuation-in-part of Ser. No. 287,638, Jun. 13, 1963, abandoned. This application Nov. 19, 1968, Ser. No. 778,362

Int. Cl.[2] B05B *5/04*

U.S. Cl. 118—626 **4 Claims**



2. Electrostatic coating apparatus comprising, in combination,

a store of solid pulverulent coating material,

a rotary discharge member having a sharp peripheral edge supported adjacent the work to be coated,

means defining a feed passage open to the atmosphere and leading from said store to a point spaced from said discharge member for feeding the pulverulent coating material thereto, said dicharge member including an open, unobstructed surface facing the feed passage for receiving the mass of material therefrom,

means for rotating said discharge member at a speed sufficient to shape the mass of material being fed to said surface into a thin pulverulent sheet of substantially uniform thickness and to permit the free discharge and dispersion of said sheet by cenrifugal force from said peripheral edge,

a source of high D.C. potential, and

means connected to said source and operatively associated with said peripheral edge for electrically charging the particles of material from said sheet as they are discharged from said member, to thereby produce an electrostatic attraction between said particles and the surface being coated.

4,114,565

MILKING SYSTEM AND A VALVE THEREFOR

Peter Francis Dodé, Bramley Nr. Basingstoke, and Michael Francis Hawkins, Reading, both of England, assignors to Gascoigne Gush & Dent (Agricultural) Limited, Reading, England

Filed Aug. 17, 1976, Ser. No. 715,216

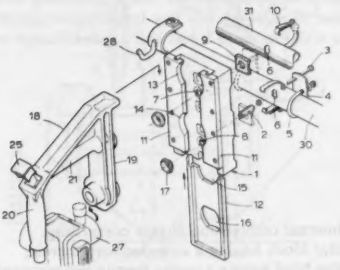
Claims priority, application United Kingdom, Mar. 25, 1976, 12016/76

Int. Cl.[2] A01J *7/00;* **F16L** *37/28*

U.S. Cl. 119—14.01 **9 Claims**

1. A milk system for milking animals for use with a milking device for connection to the udder of an animal to be milked, comprising a vacuum line for connection to a source of vacuum, a milk conveying line for connection to a milk receiver,

a plurality of valve assembly units each connected to and in flow communication with both the vacuum line and the milk conveying line at a corresponding plurality of spaced locations, each valve assembly unit comprising a body having separate milk and vacuum passages communicating respectively with the vacuum line and themmilk conveying line, and means connected thereto for opening and for closing said milk and vacuum passages, and a plurality of connector members adapted for ready connection to and disconnection from a selected one of the valve assembly units, each connector member having a first passage providing communication between the milk passage of the selected valve assembly unit and an inlet passage for milk from a milking device for connection to



the udder of an animal to be milked, and having a second passage providing communication between the vacuum passage and an outlet passage for vacuum to pass to the milking device connected to the udder of the animal to be milked wherein said means connected thereto with each valve assembly unit is provided with a plate which has two openings therein, the plate being movable between a first position in which one opening communicates with the milk passage in the valve and the other opening communicates with the vacuum passage in the valve upon engagement of a connector member with a valve assembly unit, and a second position in which the plate closes both passages upon disconnection of a connector member from a valve assembly unit.

4,114,566

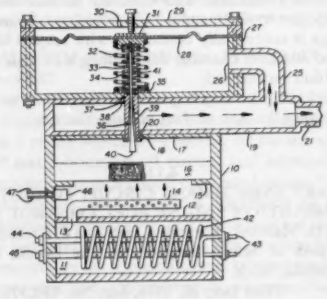
HOT FUEL GAS GENERATOR

Webster B. Harpman, Poland, Ohio, and Fred G. Mahoney, Pittsburgh, Pa., assignors to Econo Fuel Systems, Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 710,195, Jul. 30, 1976, Pat. No. 4,023,538, which is a continuation-in-part of Ser. No. 625,565, Oct. 24, 1975, Pat. No. 4,050,419. This application Apr. 27, 1977, Ser. No. 791,407

Int. Cl.[2] F02D *19/00*

U.S. Cl. 123—25 B **9 Claims**



1. A generator for producing superheated fuel gas for an internal combustion engine having an intake manifold, comprising, a closed pressure vessel having partitions dividing said vessel into first, second and third chambers in side by side relation, electric resistance heating means in said first chamber, means for energizing said heating means to generate and maintain temperatures between 800° F. and 2000° F. therein, separate means for simutaneously continuously injecting predetermined amounts of gasoline and water into said first chamber against said heating means so as to simultaneously change said gasoline to a gas and said water to steam, means for controlling the energization of said heating means and the amounts of water and gasoline injected for maintaining a desirable working pressure and volume of the superheated fuel gas in said first chamber, whereby the molecules of the superheated fuel gas in its heated pressurized gaseous condition are caused to be spaced apart a sufficient degree to support substantially complete combustion in said engine, a pressure responsive device comprising an apertured tubular member positioned through said second chamber and having its ends communicating with the first and third chambers, respectively, a valve element movable relative to the end of said tubular member communicating with said first chamber, a diaphragm positioned across said third chamber, means interconnecting said valve element and said diaphragm, and means located between said diaphragm and said tubular member balancing said diaphragm and said valve element so as to permit said diaphragm to move responsive to pressure changes in said third chamber, and outlets in said second and third chambers communicating with one another and with said inlet manifold.

4,114,567

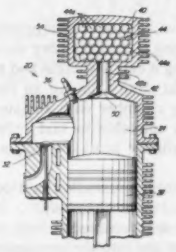
IGNITION ENHANCEMENT CHAMBER FOR INTERNAL COMBUSTION ENGINE

Ralph Ashby Burton, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Mar. 7, 1977, Ser. No. 775,250

Int. Cl.[2] F02P *23/02*

U.S. Cl. 123—30 A **10 Claims**



1. In an internal combustion engine including a combustion chamber and piston means for cyclically compressing a gaseous fuel mixture in said combustion chamber,

the improvement comprising

control means to regulate ignition firing of a combustible fuel and air mixture in said combustion chamber, and particularly adapted to regulate ignition of a mixture in which the ratio of fuel-to-air is less than stoichiometric, said control means including:

an enclosed substantially fluid tight auxiliary chamber of lesser internal volume than said combustion chamber but at least 5% of the volume thereof,

said auxiliary chamber being in gas-flow communication with said combustion chamber but spaced therefrom,

isolator means defining restricted fluid passage means interposed between said combustion chamber and said auxiliary chamber to obviate ignition-induced flashback from said auxiliary chamber to said combustion chamber,

said isolator means also being operative partially to insulate

said combustion chamber from said auxiliary chamber thermally,

packing means of heat retentive material dispersed interiorly of and distributed throughout said auxiliary chamber to provide a high surface area-to-volume ratio within said auxiliary chamber, thereby to enhance heat transfer and distribution,

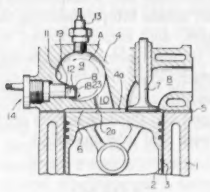
said surface area to volume ratio within said auxiliary chamber being at least 10:1.

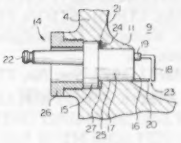
4,114,568

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY CHAMBER

Hiromichi Yanagihara, and Nobuo Habu, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 24, 1977, Ser. No. 799,919
Claims priority, application Japan, Apr. 6, 1977, 52-38491
Int. Cl.[2] F02B *19/08, 17/00*
U.S. Cl. 123—30 D **7 Claims**





1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head having a cavity therein and mounted on said cylinder block, said cavity having an inner wall which defines an auxiliary chamber with an axis;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming a main chamber therebetween;

an intake valve movably mounted on said cylinder head for leading gas into said main chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a connecting passage communicating said main chamber with said auxiliary chamber and arranged to be tangentially connected to the inner wall of said auxiliary chamber for creating a strong swirl motion of the gas in said auxiliary chamber at the time of the compression stroke, the inner wall of said auxiliary chamber having a recess at a position located opposite to the inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber;

a fuel injector having an injecting nozzle disposed in said auxiliary chamber and directed to said recess for forming a rich air mixture therein and for forming a lean air-fuel mixture in said auxiliary chamber, and;

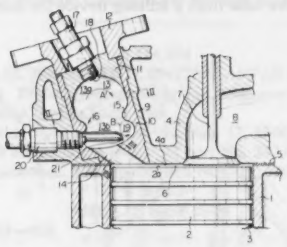
a spark plug having a central electrode and an earthing electrode which define a spark gap therebetween located in said auxiliary chamber, said central electrode having a mounting end covered by an insulator which is arranged to be directly exposed to the swirling stream of a lean air-fuel mixture created in said auxiliary chamber, while the spark gap of said spark plug is located in said recess in which a rich air-fuel mixture is formed.

4,114,569

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Yoshio Yamakawa, Toyota; Hiromichi Yanagihara, and Nobuhiro Miura, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 2, 1977, Ser. No. 802,909
Claims priority, application Japan, Apr. 6, 1977, 52-38492
Int. Cl.[2] F02B *19/08, 17/00*
U.S. Cl. 123—30 D **5 Claims**



1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head having a cavity therein and mounted on said cylinder block, said cavity having an inner wall which defines an auxiliary chamber with an axis;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming a main chamber therebetween;

an intake valve movably mounted on said cylinder head for leading gas into said main chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

an annular raised portion formed on the inner wall of said auxiliary chamber and defining a restricted opening of an approximately circular shape, said annular raised portion dividing said auxiliary chamber into a first chamber of approximately spherical shape and a second chamber of an ellipsoid shape which are arranged in tandem along the axis of said auxiliary chamber, and forming a recess in said second chamber beneath said annular raised portion, the volume of said second chamber being in the range of 20 through 40 percent relative to the volume of the first chamber;

a connecting passage formed in said cylinder head and communicating said main chamber with said auxiliary chamber, said connecting passage being arranged to be tangentially connected to the inner wall of said second chamber for creating a swirl motion of the gas at the time of the compression stroke;

a fuel injector having an injecting nozzle disposed in said auxiliary chamber and directed to said recess located opposite to the inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber for forming a rich air-fuel mixture in said recess, and;

a spark plug having a spark gap located in said recess for igniting the rich air-fuel mixture therein.

4,114,570

START ENRICHMENT CIRCUIT FOR INTERNAL COMBUSTION ENGINE FUEL CONTROL SYSTEM

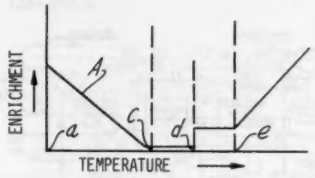
Roman O. Marchak, Northville, and Glen J. Drellishak, Rochester, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 20, 1976, Ser. No. 752,376
Int. Cl.[2] F02B *3/02;* **F02M** *7/00*
U.S. Cl. 123—32 EG **14 Claims**

1. In combination with an electronic fuel control system for

an internal combustion engine wherein said internal combustion engine has an electrically energized starter including a starter switch generating a start signal operative to energize the starter and the electronic fuel control system includes sensors generating signals indicative of the engine's operating parameters including a temperature sensor generating a signal indicative of the engine's temperature, a fuel control computer generating output signals indicative of the engine's fuel requirements in response to input signals including the signals generated by the sensors, and a fuel delivery means controlling the amount of fuel delivered to the engine in response to the output signals generated by the fuel control computer, a start enrichment circuit comprising:

means for generating a start enrichment signal in response to the temperature signal and the start signal, said enrichment signal having a first initial value which is an inverse



function of the engine temperature below a first predetermined temperature and a second initial value which is a direct function of engine temperature above a second predetermined temperature, a third initial value between said first predetermined temperature and a third predetermined temperature, said third predetermined temperature intermediate said first and second predetermined temperatures, and a fourth initial value different from said third initial value between said second and third predetermined temperatures, said start enrichment signal maintaining its first, second, third, and fourth initial values during the presence of said start signal and decaying to zero after the termination of said start signal in a time determined by said initial values wherein said fuel control computer generates signals indicative of an increased fuel delivery to the engine in response to said start enrichment signal.

4,114,571

MEANS FOR CONTROLLING THE OIL COOLING OF THE PISTON OF A PISTON ENGINE

Max Ruf, Römerstrasse 11, Obereisesheim, Fed. Rep. of Germany

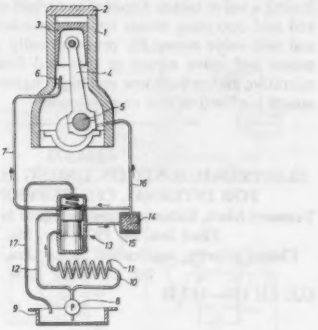
Filed Oct. 7, 1976, Ser. No. 730,298

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546273

Int. Cl.[2] **F01M** *1/02;* **F01D** *3/06;* **F16N** *13/22*

U.S. Cl. 123—41.35 **7 Claims**

1. An arrangement for controlling the oil flow in an internal combustion engine having bearings connected to a lubricating oil circuit and a piston cooled by a cooling oil circuit which is branched off said lubricating oil circuit, said lubricating oil circuit comprising a pump, a cooler connected on one hand to said pump and on the other hand to a lubricating oil pipe, a bypass pipe bypassing said cooler, and control means responding to the oil temperature and having a first position below a certain oil temperature for connecting said lubricating oil pipe to said bypass pipe and simultaneously disconnecting said lubricating oil pipe from said cooler, and a second position at and above said temperature for disconnecting said lubrication oil pipe from said bypass pipe and simultaneously connecting said lubricating oil pipe to said cooler, said control means being interposed also in said cooling oil circuit for cutting off and



opening, respectively, said cooling oil circuit in the first position and second position, respectively, of the control means.

4,114,572

FUEL-AIR MIXTURE FEED DEVICE OF THE MULTIPLE CYLINDER AND MULTIPLE CARBURETOR TYPE FOR AN INTERNAL COMBUSTION ENGINE

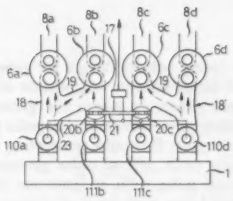
Munekazu Matsuda, Nishinomiya, and Yoshiaki Sakaue, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Sep. 30, 1976, Ser. No. 728,205

Claims priority, application Japan, Oct. 4, 1975, 50/120195

Int. Cl.[2] **F02M** *13/04*

U.S. Cl. 123—59 PC **1 Claim**



1. A fuel-air mixture induction system for use with a multiple cylinder internal combustion engine, each of said cylinders having an intake port and an exhaust port, the improvement comprising a plurality of carburetors wherein the number of carburetors is equal to the number of cylinders of said engine, each of said carburetors having a variable throat, a main intake conduit interconnecting said variable throat of one carburetor with the intake port of one of said cylinders, a branch conduit coupling at least a pair of said main conduits into communication, means operatively connected to said carburetors for rendering said carburetors operative for feeding a fuel air mixture to their respective corresponding cylinders during both high and low load operation of said engine, and means for directing the fuel air mixture to said branch connected main conduits during low load operation only, and an operating means coupled to said last two mentioned means for simultaneously and proportionally controlling the operation of said respective last two mentioned means whereby the optimum fuel-air mixture is introduced into the respective cylinders in accordance to the operating load imposed on the engine so that during high load operation, the fuel-air mixture is supplied directly through the main conduits interconnected between the respective carburetors and corresponding connected cylinders, and during low load operation, the fuel-air mixture is supplied through the carburetors supplying said branch connected main

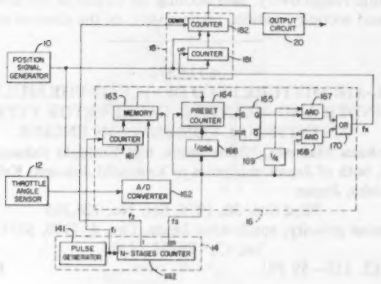
conduits, said first-mentioned means being operatively connected to each of said carburetors for varying the throat thereof a corresponding amount, sand said second means comprising a valve means disposed in certain of said main conduits, and said operating means being connected to said first means and said valve means for proportionally controlling said first means and valve means so that said first means is rendered operative during both low and high engine loads and said valve means is closed at low engine loads.

4,114,573

ELECTRONIC IGNITION TIMING CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Yasunori Mori, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 28, 1977, Ser. No. 763,695
Claims priority, application Japan, Jan. 28, 1976, 51-7505
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 D **9 Claims**



1. An ignition timing control device for generating an ignition timing signal for an internal combustion engine, comprising position signal generator means for generating position pulses corresponding to predetermined angular positions of the crankshaft of the engine, first pulse generating means for generating a first pulse train, second pulse generating means for generating a second pulse train, at least one of said first and second pulse trains being composed of consecutive time portions each made up of at least first and second pulse groups of different frequency, means for selectively regulating the relative time durations of said first and second pulse groups in each time portion of said at least one pulse train in accordance with an operating condition required of the engine, first counting means for counting said first pulse train from said first pulse generating means and being reset upon receipt of each position pulse from said position signal generator means, second counting means which is preset to the count of said first counting means by each position pulse prior to reset of said first counting means for decrementing the count thereof in response to said second pulse train from said second pulse generating means, and output means for generating said ignition timing signal each time the count of said second counting means is reduced to a predetermined value.

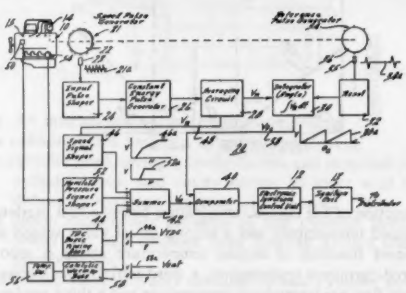
7. An ignition timing control device for generating an ignition timing signal for an internal combustion engine, comprising position signal generator means for generating a position signal related to the angular position of the crankshaft of the engine, first pulse generating means for generating a first pulse train divided into consecutive time portions each made up of at least first and second pulse groups of different frequency, means for selectively regulating the relative time durations of said first and second pulse groups in each time portion in accordance with an operating condition required of the engine, second pulse generating means for generating a second pulse train, first counting means for counting one of said first and second pulse trains for a period whose duration corresponds to a predetermined angular rotation of said crankshaft as determined from said position signal, second counting means for decrementing the maximum count of said first counting means in response to the other of said first and second pulse trains, and output means for generating said ignition timing signal each time the count of said second counting means is reduced to a predetermined value.

4,114,574

ELECTRONIC SPARK TIMING ADVANCE CONTROLLER

George E. Platzer, Jr., Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 322,577, Jan. 10, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,895
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R **10 Claims**



1. An electronic spark timing advance ignition system for an internal combustion engine comprising:

means for generating a first electrical signal quantity whose amplitude varies with engine speed and for deriving from said first electrical signal quantity a cyclically repeating second electrical signal quantity whose amplitude varies independently of engine speed as a function of the angular rotational position of the engine crankshaft and reaches the same peak amplitude each cycle of repetition thereof, said means including

an electrical signal pulse generator having a predetermined angular positional setting relative to the engine crankshaft and driven thereby for producing a train of pulses having a repetition rate related to engine speed and

integrator means having an integrating input terminal coupled to receive said first signal quantity and a reset input terminal coupled to said signal pulse generator to be electrically reset by each and every signal pulse therefrom at said predetermined angular positional setting thereof relative to the engine crankshaft for producing said second electrical signal quantity from said first electrical signal quantity;

means for producing a reference electrical signal quantity of a predetermined fixed amplitude value independent of the engine speed related first signal quantity and the engine crankshaft position related second signal quantity, said refernce signal quantity corresponding to the amplitude value of said second electrical signal quantity at a predetermined initial angular position of the crankshaft at which it is desired to fire the engine;

comparing means having an input terminal coupled to receive said second electrical signal quantity and another input terminal coupled to receive said reference electrical signal quantity for comparing said signal quantities to produce an ignition trigger signal at said predetermined initial angular position of the engine crankshaft; and

means for modifying the occurrence of said ignition trigger

signal in accordance with said first electrical signal quantity including means for algebraically combining said first electrical signal quantity with said reference electrical signal quantity and applying the combined electrical signal therefrom to said comparing means for comparison with said second electrical signal quantity.

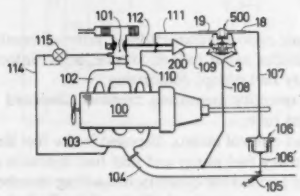
said combining means connected between the integrating input terminal of said integrator means and the said another input terminal of said comparing means.

4,114,575

EXHAUST PRESSURE REGULATING SYSTEM

Hidetaka Nohira, and Masaaki Tanaka, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 30, 1975, Ser. No. 627,351
Claims priority, application Japan, Jul. 1, 1975, 50-80513
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **14 Claims**



1. An exhaust pressure regulating system in combination with an internal combustion engine having a carburetor in which a venturi vacuum pressure is created by air taken into the engine therethrough, an intake manifold and an exhaust comprising:

pressure-sensitive valve means including an exhaust valve in the exhaust for directly adjusting the back pressure in the exhaust;

a pressure-signal passage for applying the vacuum pressure in the intake manifold directly to said pressure-sensitive valve means;

a pressure-comparing valve including first and second interlocked diaphragms for modulating the vacuum pressure in said pressure-signal passage;

means for applying the venturi vacuum pressure created by the quantity of air taken into the engine through the carburetor to said first diaphragm;

means for applying the adjusted back pressure in the exhaust to said second diaphragm; and

wherein said pressure-comparing valve includes a valve member in said pressure-signal passage for bleeding off pressure therein, said valve member tending to be opened by pressure against said second diaphragm in opposition to the vacuum pressure applied to said first diaphragm.

4,114,576

EXHAUST GAS RECIRCULATING CONTROL SYSTEM

Mikio Goto; Mitsunori Sasano, both of Toyota; Koichi Oosawa, Susono, and Mitsuya Yoshihara, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Kogyo Kabushiki Kaisha, both of, Japan

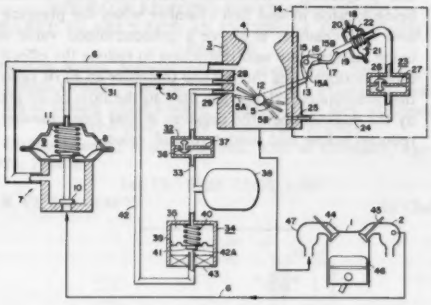
Filed Dec. 13, 1976, Ser. No. 750,185
Claims priority, application Japan, Jun. 9, 1976, 51-75632[U]
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**

1. An exhaust gas recirculating control system for an internal combustion engine comprising:

a means for recirculating exhaust gas from an exhaust manifold to an air intake of said internal combustion engine whenever a vacuum exists in said air intake;

a means for applying air pressure to said recirculating means instead of a vacuum whenever a vacuum exists in said air intake of a predetermined magnitude; and

a means for delaying operation of said air pressure applying



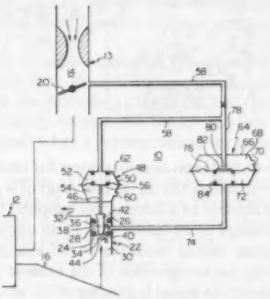
means for a predetermined time interval whereby exhaust gas recirculation is allowed for some predetermined time after acceleration of said internal combustion engine occurs.

4,114,577

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 13, 1977, Ser. No. 787,161
Claims priority, application Japan, Apr. 16, 1976, 51-43263
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including

an intake passage providing communication between the atmosphere and the engine, and

an exhaust gas passageway providing communication between the engine and the atmosphere, said EGR control system comprising

an EGR passageway providing communication between the exhaust gas passageway and the intake passageway for recirculating thereinto exhaust gas emitted from the engine, said EGR passageway/having provided therein

a restriction for restricting said EGR passageway;

an EGR control valve which is disposed in said EGR passageway downstream of said restriction for controlling the flow of recirculated exhaust gas and defines a first chamber interposed between said restriction and said EGR control valve, and

first control means for increasing and reducing the degree of opening of said EGR control valve in accordance with increases and decreases in the pressure in said first cham-

ber due to variations in a suction vacuum in the intake passageway, respectively, in which said EGR control valve comprises

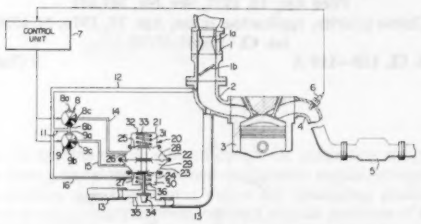
an extension fixedly connected to said EGR control valve and projecting toward said restriction, said extension being located in said first chamber when the pressure in said first chamber is above a predetermined value and being inserted into said restriction to reduce the effective cross sectional area thereof and therefore an EGR ratio of the recirculated exhaust gas flow to the flow of air taken by the engine when the pressure in said first chamber is reduced below said predetermined value.

4,114,578

AIR-TO-FUEL RATIO CONTROL SYSTEM

Tadashi Hattori, Okazaki; Takamichi Nakase, Gamagori, and Tokio Kohama, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 12, 1977, Ser. No. 796,225
Claims priority, application Japan, May 28, 1976, 51-62543
Int. Cl.[2] F02M *23/04, 7/12*
U.S. Cl. 123—124 R **3 Claims**



1. An air-to-fuel ratio control system for internal combustion engines for adjusting the air-to-fuel ratio of a mixture by controlling the amount of additional air supplied through an additional air passage to an intake port of an engine, comprising:

gas detector means mounted in an exhaust manifold for detecting the composition of the exhaust gas and generating a detection signal indicative of the air-to-fuel ratio of a mixture;

control unit means for generating a control signal in response to said detection signal;

main drive means for driving an adjustment valve mounted in said additional air passage to adjust a passage area thereof, said driving means having first and second pressure chambers divided by a main diaphragm connected to said adjustment valve by means of a rod;

means for introducing vacuum in the intake port into at least one of said first and second pressure chambers in response to said control signal thereby to produce a pressure difference between said pressure chambers to drive said adjustment valve to increase or decrease the passage area;

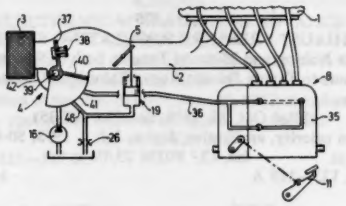
auxillary drive means having a third pressure chamber and an auxiliary diaphragm connected to said rod for biasing the movement of said adjustment valve in a direction to decrease the passage area due to the intake port vacuum being introduced into said third pressure chamber, thereby to prevent the amount of additional air supplied to the engine being affected by variations in the intake port vacuum.

4,114,579

FUEL-AIR-MIXTURES CONTROLLER FOR INTERNAL COMBUSTION ENGINES

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 551,498, Feb. 20, 1975, Pat. No. 4,015,571.
This application Nov. 30, 1976, Ser. No. 746,045
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **11 Claims**



1. A fuel-air ratio regulator for an internal combustion engine that includes an air induction tube, a fuel injection pump and a primary fuel pump, comprising:

(a) an air quantity measuring member, disposed in said air induction tube;

(b) first fuel control means, disposed in the fuel line between said primary fuel pump and said fuel injection pump, and actuated by said air quantity measuring member; and

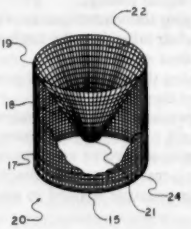
(c) air flow control means, disposed in the induction tube and connected to the first fuel control means for actuation by said first fuel control means; whereby the air quantity aspirated by the engine is compared to the allotted fuel quantity and a desired fuel-air ratio is maintained automatically.

4,114,580

DISTRIBUTION RECTIFIER FOR INLET MANIFOLD SYSTEMS

Ronald Galen Coats, Box 595 Rte. #1, Lexington, Ind. 47138

Filed Jun. 20, 1977, Ser. No. 808,054
Int. Cl.[2] F02M *29/04*
U.S. Cl. 123—141 **8 Claims**



1. In a carburetor system for internal combustion engines which includes a carburetor for supplying a mixture of fluid fuel and air and an intake manifold, a distribution rectifier situated after said carburetor and in direct contact with the intake manifold, said distribution rectifier comprising a foraminous cylindrical member having an opening at the upstream end thereof, the bottom portion of said foraminous cylindrical member in direct contact with the intake manifold and closing the bottom portion of the downstream end thereof, a foraminous curved member attached along its peripheral edge to said cylindrical member at the upstream end thereof, said curved member having a major orifice coextensive with the opening of the upstream end of said cylindrical member, and a minor orifice defined at the apex of said curved member, said minor

orifice being situated axially within and substantially at an intermediate portion of said cylindrical member.

4,114,581

PULSE-SUPPLIED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

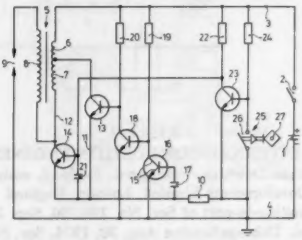
Bert Wurst, Möglingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 12, 1976, Ser. No. 704,564

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531302

Int. Cl.² F02P *3/04*

U.S. Cl. 123—148 E **10 Claims**



1. Ignition system for an internal combustion engine having an ignition coil (5) with a tapped primary winding to provide a first partial primary (6) and a second partial primary (7), serially connected with the first partial primary (6);

a first switchable control circuit (11, 13) connected to the tap point of the primary winding, in series with the first partial primary (6) and comprising a first controlled switch (13);

a second switchable control circuit (12) comprising the second partial primary (7) and a second controlled switch (14);

and means (25, 22, 23, 21) controlling connection of the controlled switches (13, 14) to energize the coil

a sensing resistor (10) connected in circuit with said first control circuit (11) and sensing when current through the first partial primary (6) has reached a predetermined value,

a control capacitor (21) connected in series with said sensing resistor (10) to have its charge current controlled by current flow through the sensing resistor (10), the control capacitor being connected to the control terminal of the second controlled switch (14) of the second control circuit,

a control circuit (15; 16, 17; 16, 28, 29; 31, 28, 29, 30) connected to and controlled by current flow through said sensing resistor (10) and controlling the switching state of said first controlled switch (13) to control current flow through said first controlled switch (13) and hence through said first partial primary and provide for rapid rise in stored energy in the coil (5) and, when the current flow through said first partial primary and the sensing resistor (10) has reached the predetermined value, to control said first controlled switch (13) to open and provide for current flow through said first and second partial primaries (6, 7) at a low value whereby said sensing resistor (10) will control change-of-state of said first controlled switch (13),

said series circuit of the resistor (10) and the control capacitor (21) controlling the second controlled switch to be in conductive state when the first controlled switch (13) opens to permit continued current flow through both the first partial primary (6) and the second partial primary (7) of the primary winding of the ignition coil;

and an ignition control switching means (25) connected to supply charging current for said control capacitor (21) upon closing of said ignition control switching means to current supplying state.

4,114,582

VOLTAGE LIMITED IGNITION SYSTEM, PARTICULARLY FOR AN INTERNAL COMBUSTION ENGINE

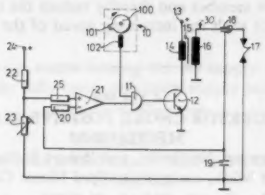
Friedrich Rabus, Schwieberdingen; Josef Wahl, Stuttgart, and Günter Grüther, Pinache, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,739

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614780

Int. Cl.² F02P *11/00, 1/00*

U.S. Cl. 123—148 E **10 Claims**



1. Voltage limited ignition system to provide an ignition pulse to a spark gap (17), particularly the spark plug of an externally ignited internal combustion engine having

an ignition coil (15), the secondary (16) of which is connected to the spark gap (17);

a controlled switch (12) serially connected to the primary (14) of the coil;

ignition control means (10) controlling opening and closing of the switch (12) to control flow through the coil and hence generation of ignition voltage at the secondary thereof;

and comprising, in accordance with the invention, a voltage sensing circuit (18, 19) including a threshold stage (21) connected to the secondary (16) of the coil (15) and sensing the secondary voltage, the threshold stage providing an output signal when a predetermined secondary voltage is exceeded;

and blocking means (11) controlled by the output signal from the threshold stage (21) and connected to block supply of power to the spark gap when the threshold level of the threshold stage has been exceeded.

4,114,583

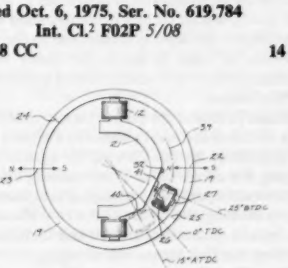
TRIGGERED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH ANTI-REVERSERUNNING CONTROL

Richard L. Sleder, Fond du Lac, and Robert C. Schmiedel, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 6, 1975, Ser. No. 619,784

Int. Cl.² F02P *5/08*

U.S. Cl. 123—148 CC **14 Claims**



1. A signal generator generating a signal proportional to

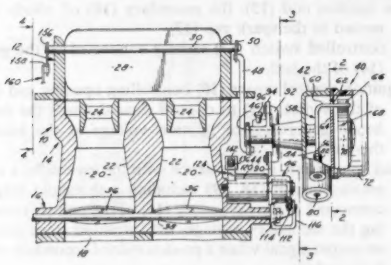
speed, comprising a rotor having an input adapted to be coupled to a drive means and rotated about an axis, a stator coupled to said rotor, and including core means with a first stator core member and a second stator core member mounted in a close spaced relation, said second core member having a circular construction and mounted concentrically of said axis, said first stator core member being mounted for adjustable positioning about said axis and therefore relative to said second stator core member and changing of the working air gap between said first and second stator core members, a trigger coil means wound on said first core member to control the timing in accordance with the angular positioning of the first core member and simultaneously varying the output level of the coil means in accordance with the air gap, a speed control means providing increasing and decreasing speed setting, and ajustable means coupled to the speed control means and to said first core member to adjust the operative coupling of the setting of said first core member and thereby reduce the output level of said generator with the increasing speed of the speed control means.

4,114,584

CARBURETOR CHOKE POSITIVE CLOSURE MECHANISM

Jerry B. Rogerson, Northville, and Robert S. Harrison, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 26, 1977, Ser. No. 763,254
Int. Cl.² F02M *1/10*
U.S. Cl. 123—179 G **2 Claims**



1. A choke valve positioner for use in a carburetor having an air/fuel induction passage open at one end and adapted to be connected to an engine intake manifold at the other end for subjecting the passage to varying manifold vacuum,

an unbalance mounted, air movable choke valve mounted for a variable rotative movement across the passage in response to airflow thereagainst from a closed position towards a wide open position to control air flow through the passage,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a first nearly closed but still open cold engine running position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,

power means operatively connected to the choke valve and operable at times to move the choke valve to a closed position beyond the nearly closed position attained by the spring means,

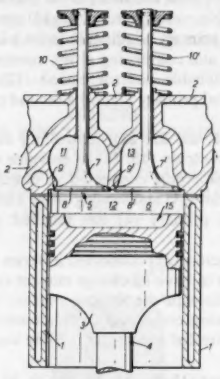
and means to render the power means operative and inoperative to move the choke valve to a closed position at times in opposition to the flow of air against the choke valve urging the choke valve in an opening direction, including first means operatively engageable at times with the choke valve moving the choke valve to a closed position when the power means is operative and including second means moving the first means out of engagement with the choke valve when the power means is inoperative to thereby permit the opening of the choke valve when the power means is inoperative to thereby permit the opening of the choke valve by the flow of air thereagainst, and other means connecting the power means to the engine ignition system to render the power means operative during engine cranking conditions and inoperable during other engine operating conditions, the other means includes movable lever means operatively engageable at times with the choke valve, first spring means biasing the lever means out of engagement with the choke valve to permit free rotation of the choke valve, and normally inoperable second spring means engageable with the power means and lever means and operable in response to operativeness of the power means to bias the lever means into operative engagement with the choke valve moving the same to its closed position.

4,114,585

INTERNAL-COMBUSTION ENGINES

Terence Brian Dawkins, Fakenham, England, assignor to Terrytune Developments Limited, London, England

Continuation-in-part of Ser. No. 290,756, Sep. 20, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,196
Claims priority, application United Kingdom, Sep. 28, 1971, 45238/71
Int. Cl.² F02B *23/00*
U.S. Cl. 123—191 M **7 Claims**



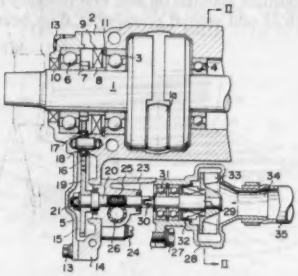
1. A normally aspirated high-speed spark-ignition internal-combustion engine, for powering a motor vehicle, of the kind having a plurality of cylinders, each of which has a piston fitted therein and is provided with two and only two poppet valves, mounted separately from one another and constituting respectively a single inlet valve and a single exhaust valve, each of said poppet valves comprising a closure member mounted in a cylinder-head of the engine for movement into and out of closing engagement with one and only one valve seat therefor, and operable in accordance with a four-stroke cycle in which each piston is driven in its cylinder by expansion of gases heated by combustion of a gasoline-air mixture delivered to a combustion chamber at one end of the cylinder by way of the inlet valve of the cylinder, the combustion products being expelled from each cylinder, by way of its exhaust valve, to an exhaust manifold of the engine, and the compression ratio of the engine being less than 11:1, characterised in that the area ($\pi D^2/4$) of the exhaust valve of each cylinder is at least seven percent greater than that of the inlet valve.

4,114,586

ACCESSORY MOUNTING MEANS FOR INTERNAL COMBUSTION ENGINES

Tetsuzo Fujikawa, Kobe, and Kichiji Misawa, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 623,119, Oct. 16, 1976, abandoned.
This application May 18, 1977, Ser. No. 798,126
Claims priority, application Japan, Oct. 17, 1974, 49-125943
Int. Cl.[2] F02F 7/00; F16H 1/20
U.S. Cl. 123—195 A 1 Claim



1. An internal combustion engine including a crankcase, a crankshaft mounted in the crankcase for rotation about a first axis, an oil pump including a first casing mounted on the crankcase externally thereof, a first accessory drive shaft mounted in the first casing for rotation about a second axis extending parallel with the first axis, one end of the first accessory drive shaft being interconnected with and driven by the crankshaft, means for driving the oil pump from the first accessory drive shaft, first bearing means in the first casing supporting said one end of the first drive shaft, a second casing mounted on the crankcase externally thereof, a second accessory shaft rotatably mounted in the second casing, said second shaft axially aligned with and drivingly connected with the other end of the first accessory drive shaft, a water pump element mounted for rotation with the second accessory shaft, second bearing means in the second casing providing the sole bearing support for said other end of the first drive shaft, said second casing being releasably supported on said first casing, water passage means in the crankcase, and water port means in the second casing directly connected with said water passage means in the crankcase.

4,114,587

FAIL-SAFE OIL FEED CONTROL LINKAGE FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

Toshio Amano, and Hidetoshi Kaku, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 14, 1976, Ser. No. 750,316
Claims priority, application Japan, Dec. 16, 1975, 50-170290[U]
Int. Cl.[2] F01M 1/00
U.S. Cl. 123—196 S 3 Claims

1. A fail-safe lubricating oil supply control linkage for a two cycle internal combustion engine, comprising:

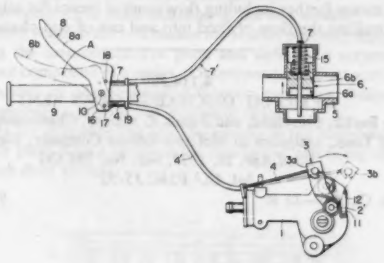
(a) an oil pump housing,

(b) an oil supply control lever pivotally mounted on the housing for rotation about a control axis between a closed, minimum oil supply position and a fully open, maximum oil supply position,

(c) a throttle lever rotatable about a pivot axis,

(d) a throttle control wire connected to the throttle lever on one side of the pivot axis,

(e) an oil supply control wire having one end connected to the oil supply control lever and the other end connected to the throttle lever on the other, opposite side of the pivot axis, and



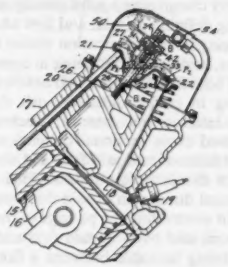
(f) first spring means biasing the oil supply control lever toward the fully open, maximum supply position.

4,114,588

VALVE DEACTUATOR FOR INTERNAL COMBUSTION ENGINES

Edgar R. Jordan, 32260 W. 12 Mile Rd., Farmington, Mich. 48024

Filed Jun. 24, 1976, Ser. No. 699,612
Int. Cl.[2] F02D 13/06
U.S. Cl. 123—198 F 19 Claims



1. An internal combustion engine having a valve movable between open and closed positions to control an intake or exhaust port, valve biasing means urging said valve to it closed position, movable input means, an elongated support member having one end mounted between said valve and input means, a slotted rocker arm slidably receiving said support member and engaging said input means and valve on opposite sides of said support member, a fulcrum member slidably mounted on said support member and seated against said rocker arm on the side thereof opposite said one end, and hydraulic valve deactivating means having (1) an active condition in which said fulcrum member is held in a fixed position on said support member to cause said rocker arm to pivot about said fulcrum member in response to movement of said input member to cause opening and closing movement of said valve, and (2) an inactive condition in which said fulcrum member reciprocates on said support member and said rocker arm pivots about its engagement with said valve in response to movement of said input means such that the pivoting action of said rocker arm transmits no movement to said valve; said valve deactivating means including a rocker arm fulcrum control unit mounted on said support member between the other end of said support member and said fulcrum member, said fulcrum control unit being extendable to a position to engage and hold said fulcrum member in its fixed position and retractable to a position to permit the fulcrum member to reciprocate along said support

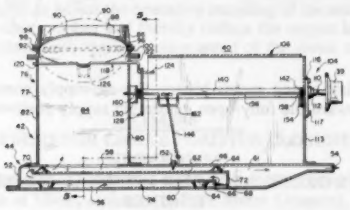
member, said fulcrum control unit having a chamber that expands and contracts when fluid is, respectively, admitted to and exhausted from said chamber to cause extension and retraction, respectively, of said control unit; and said deactivating means further including flow control means for selectively controlling the flow of fluid into and out of said chamber.

4,114,589

OPTIONAL DISCHARGE OVEN VENT

Lee Berlik, Cleveland, and James E. Hurley, Chattanooga, both of Tenn., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Apr. 18, 1977, Ser. No. 788,692
Int. Cl.² F24C *15/32*
U.S. Cl. 126—21 R **9 Claims**



1. A venting system for expelling heated air from a food-processing oven or the like cooking appliance selectively to one of the exterior and interior of the household in which the oven is installed, said venting system including:

a duct assembly comprising a substantially enclosed housing, said housing defining an inlet and first and second outlets, said inlet being in communication within an exhaust outlet of said oven, said first outlet being in communication with one of said household interior and exterior and the second outlet being in communication with the other of said household interior and exterior, duct means having a predetermined cross sectional dimension defined in said housing between one of said first and second outlets and said inlet, a damper plate dimensioned similarly to the cross sectional dimension of said duct means, mounted in the latter for controlling the passage of the heated oven air expelled from said oven to said first and second outlets, said plate being movable between a first position across the flow of air through said duct means for blocking the latter and a second position, generally in the direction of the flow of air through said duct means for unblocking the latter, means for biasing said damper plate to the second, unblocking position, and damper plate actuator means mounted adjacent the damper plate, said damper plate actuator means being operable to a first position to move said damper plate to said first, blocking position and being operable to a second position to permit said damper plate to be biased to said second, unblocking position.

4,114,590

AIR FEED FIREPLACE GRATE

Harlan C. Frahm, Burlington, Wis., assignor to Frahm Fireplace Grate Co., Inc., Burlington, Wis.

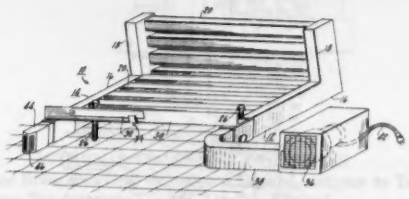
Filed Oct. 13, 1976, Ser. No. 731,962
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **16 Claims**

1. A grate suitable for positioning in a fireplace opening into a room, said grate receiving combustible material and comprising:

a pair of spaced, hollow side frames lying generally perpendicular to the opening of the fireplace, each of said frames comprising a generally horizontal hollow arm member of generally rectangular cross section, said arm member having an opening at a first end located adjacent the opening of the fireplace and a second end joined to the lower end of an upstanding hollow support member having the cross section configuration of said arm member, said arm member and said upstanding support member lying in a generally vertical plane and forming a hollow conduit;

a first plurality of hollow flues extending laterally between, and communicating with the interior of, said arm members of said side frames, said first plurality of flues being spaced from each other in a generally horizontal plane and capable of receiving and supporting combustible material;

a second plurality of hollow flues extending laterally between, and communicating with the interior of, said upstanding support members of said side frames for retaining said combustible material on said first plurality of hollow flues, each of said second plurality of flues being spaced



from those above or below it, the burning of the combustible material heating the flues of said first plurality a greater amount than said second plurality;

means coupled to the first end of said arm member of one of said side frames for providing an air flow into one of said side frames, through said flues, and out the first end of said arm member of the other of said side frames for discharge into the room, the upper ends of said upstanding members being closed; and

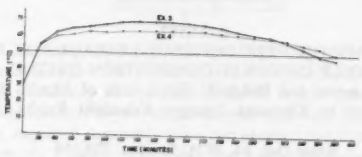
connection means associated with said flues and side frames establishing differing amounts of communication and flow through different ones of said flues and controlling the air flow through said respective flues to increase the air flow through the first flues relative to the air flow through the second flues.

4,114,591

EXOTHERMIC METALLIC COMPOSITION

Hiroshi Nakagawa, Oeda 89-8-25, Kasukabe-shi, Saitama, Japan

Filed Jan. 10, 1977, Ser. No. 757,890
Int. Cl.² F24J *1/02*
U.S. Cl. 126—263 **7 Claims**



1. A body warmer comprising: an exothermic composition which comprises a principal metallic member selected from the group consisting of iron, aluminum and magnesium in particulate form; and an oxidation agent in an amount stoichiometrically equal to said principal metallic member comprising water of 20 – 50 parts by weight; sodium chloride of 5 – 10 parts by weight; an oxide member selected from the group consisting of ferrosoferric oxide, trimanganese tetraoxide, manganese dioxide and mixtures thereof in particulate form of 10 – 60 parts by weight; and active carbon in particulate form of 20 – 50 parts by weight;

a first container containing said principal metallic member;

a second container containing said oxidation agent; and

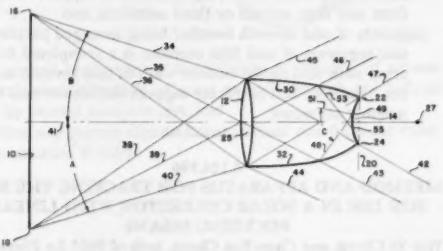
a porous bag means for containing the mixture of the contents of said first container and said second container, said first and second containers being kept separate and apart from each other until it is desired to mix the contents of the same in said porous bag means.

4,114,592

CYLINDRICAL RADIANT ENERGY DIRECTION DEVICE WITH REFRACTIVE MEDIUM

Roland Winston, Chicago, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,863
Int. Cl.[2] F24J *3/02; G02B 5/10, 5/14*
U.S. Cl. 126—270 **15 Claims**



1. A device for collecting and concentrating solar energy incident on an entrance onto the surface of an energy absorber where said absorber surface is of less area than said entrance surface, the entrance surface being on a first side of a first reference axis, the absorber surface having a cross section bounded by and which is convex with respect to the first reference axis on said first side of said first reference axis, the absorber surface having a second reference axis extending therethrough perpendicular to said first reference axis, the perimeter of the cross section of the absorber surface extending from a first edge point along the first reference axis to a second edge point along the first reference axis, comprising:

a refractive element and a first reflective boundary, said boundary and said element being positioned on said first side of said first reference axis between the absorber and entrance surface such that extremal rays from a source of solar energy incident on the entrance surface at an angle with respect to said second reference axis equal to or less than a predetermined value are refracted unequally by said refractive element, said first reflective boundary being of such contour that the slope of any point along said contour is the maximum slope consistent with achieving reflection of any extremal ray of energy incident on said entrance surface and then refracted and incident on said point of said boundary along a line which intersects the perimeter of the cross section of the absorber surface at an angle not exceeding a particular value C where C is less than or equal to 90°, said reflective boundary extending from said first edge point of said absorber to no further than an intersection with said entrance surface, said boundary and said absorber being parallel to a third reference axis perpendicular to said first and second reference axis to form a trough-shaped device.

4,114,593

SOLAR HEATING SYSTEM

Emile Guertin, Wheeler Rd., Marstons Mills, Mass. 02648

Filed Feb. 23, 1976, Ser. No. 660,505
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **9 Claims**

1. A solar heating system comprising;

a box means having a bottom wall and a plurality of side walls and including insulating means in the box means for holding generated heat inside the box means,

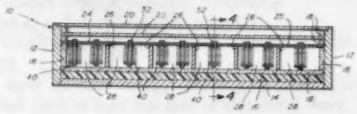
at least one translucent panel covering the box means and positioned to receive rays from the sun,

a heat-conductive plate disposed in the box means,

separate walls in the box means for at least partially supporting the heat-conductive plate and defining a serpentine duct comprised of a series of interconnected duct sections,

a plurality of heat dissipators wherein each heat dissipator comprises a plurality of dissipator plates,

means for mounting the heat dissipators to the heat-conductive plate with a series of the dissipators extending along each duct section,



wherein said means for mounting mounts the dissipator plates in parallel to each other and in parallel to the heat-conductive plate,

blower means coupled to the duct for forcing air therethrough,

and exit means from the duct from which the heated air departs,

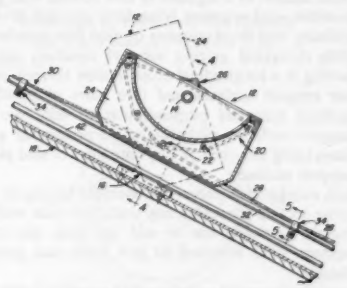
said means for mounting comprising a heat-conductive sleeve, and a plurality of conductive spacers disposed between the dissipator plates for suitably spacing the dissipator plates one from the next.

4,114,594

DEVICE FOR SYNCHRONOUSLY ROTATING SOLAR COLLECTORS

Warren A. Meyer, 612 Comanche St., NE., Albuquerque, N. Mex. 87107

Filed Oct. 22, 1976, Ser. No. 735,067
Int. Cl.[2] F24J *3/02;* **F16H** *27/02*
U.S. Cl. 126—270 **10 Claims**



1. A device for synchronously rotating solar collectors, comprising, in combination:

(a) pulley means connected to a rectangular collector for rotating same;

(b) reciprocating means movably mounted for rotating the pulley means; and

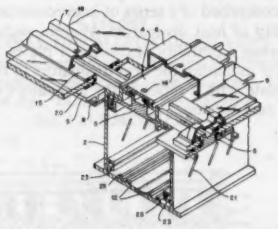
(c) flexible means connected to the pulley means and reciprocating means for rotating the pulley means in response to movement of the reciprocating means, the pulley means including a track disposed eccentrically with respect to an axis about which the associated solar collector rotates, and the pulley means being provided with clamp means mounted on the pulley means at a point on the track closest to the axis of rotation for securing the flexible means to the pulley means.

4,114,595

SOLAR ENERGY COLLECTOR AND GLAZING SYSTEM

Harold Reed Barker, 805 29th St. #252, Pittsboro, N.C. 80303

Filed Jul. 6, 1977, Ser. No. 813,289
Int. Cl.[2] F24J *3/02*; E04D *1/36*
U.S. Cl. 126—270 **6 Claims**



1. Framing apparatus for glazing solar energy collector panels, comprising:

a first elongated channel shaped glazing support member having, in a transverse cross section thereof, two partial top walls, two side walls and a bottom wall, said walls being connected to one another and having first and second pairs of parallel support surfaces formed on said side walls and top walls, respectively, said pairs of support surfaces being disposed on opposite sides of the longitudinal center of said member and in co-planar relationship with each other;

a second elongated glazing support member having two parallel support surfaces formed thereon, said member being equal in transverse cross section to that of one-half of said first member divided symmetrically at its longitudinal center line;

a third elongated glazing support member having two parallel support surfaces formed thereon, said member being equal to a transverse cross section of said first member divided longitudinally along the line to the inner edge of said support surface in said partial top wall;

a fourth member, said member being equal in longitudinal cross section to a segment of said bottom wall of said first member, said segment lying between said dividing lines defining said third member on said first member;

a fifth elongated glazing support member, said member having in a longitudinal cross section thereof, two co-planar support surfaces and two pairs of parallel gaging surfaces arranged perpendicular to said two co-planar support surfaces, said pairs of perpendicular gaging surfaces being disposed on opposite sides of said plane of said support surfaces;

a sixth elongated member, said member having, in transverse cross section thereof, a top wall, two side walls approximately perpendicular to said top wall, and two partial bottom walls attached to said walls and perpendicular thereto;

a seventh elongated member, said member having in transverse cross section thereof, a top wall, two sides walls generally inclined at an acute angle to said top wall, and two partial bottom walls attached to said side walls and parallel to said top wall;

said first through seventh members being connected together in a glazing framework in which longitudinally abutted pairs of said second members are gaged in abutment with one of said pairs of parallel gaging surfaces on a transverse segment of said fifth member and are fastened together by a transverse segment of said fourth member, said fourth and fifth member segments being connected to one another to form a combined gaging and clamping means for said abutted pairs of said second members;

said fourth member segment being an exterior gage and said pair of parallel gaging surfaces on said fifth member segment being an interior gage as spaced with said assembled pair of second members to form, in combined transverse cross section, a cross section equal to said first member;

and elongated segments of said fifth member being connected in regular array to transverse segments of said first, second or third members, said other pair of perpendicular gaging surfaces of said fifth member resting on said first parallel support surfaces of said members by engaging the height of said co-planar support surfaces of said fifth member such that said support surface of said fifth member is in a co-planar relationship with said second co-planar support surface of said first, second, or third members, respectively; and

segments of said sixth member being arranged parallel to said segments of said first member or to abutted segments of said second member or to segments of said third member in said regular array with said partial bottom walls of said sixth member overlying said second support surfaces from said first, second or third members; and

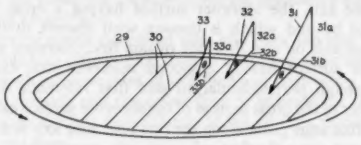
segments of said seventh member being arranged parallel to said segments of said fifth member in a completed frame array with said partial bottom walls of said seventh member overlying said co-planar support surfaces of said fifth member segments.

4,114,596

METHOD AND APPARATUS FOR TRACKING THE SUN FOR USE IN A SOLAR COLLECTOR WITH LINEAR FOCUSING MEANS

Wei-Yi Chang, and Chen-Yen Cheng, both of 9605 La Playa St, NE., Albuquerque, N. Mex. 87111

Filed Mar. 16, 1976, Ser. No. 667,408
Int. Cl.[2] F24J *3/02*; G02B *5/10*
U.S. Cl. 126—270 **4 Claims**



1. A method of tracking the sun for use in a solar collector having a linear focusing means and a linear focal region, the linear focusing means being so constructed that sun's rays that fall on the solar collector in the direction that is perpendicular to a front reference plane are directed toward the linear focal region, comprising rotating the solar collector around an axis that is perpendicular to the front reference plane and adjusting the angle of rotation so that a sun's ray incident on the solar collector has a first component perpendicular to the front reference plane and a second component parallel to the front reference plane, the second component being substantially parallel to the direction of the linear focal region.

4,114,597

UNITARY SOLAR COLLECTOR

Robert Allan Erb, Valley Forge, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

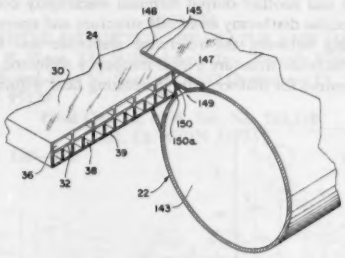
Filed Dec. 31, 1975, Ser. No. 645,648
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **68 Claims**

1. A unitary solar thermal collector panel highly effective in absorbing and transferring thermal energy and having resistance to thermal distortion, the panel being constituted of a coextruded, self-supporting synthetic thermoplastic integral unit and being adapted to collect and transfer solar energy which comprises

(a) a first section defining a first region, the first region being adapted to allow the passage of solar radiation, the first region being divided into a plurality of first channels of

which adjacent first channels are defined by first common ribs; and

(b) a second section defining a second region juxtaposed from the first region, the second region being capable of absorbing solar radiation and transferring it to a fluid, the



second region being divided into a plurality of second channels of which adjacent second channels are defined by second common ribs; and

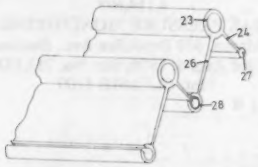
the first and second regions being defined one from the other by a common divider.

4,114,598

SOLAR HEATER AND ELEMENT THEREFOR

Egon Van Leeuwen, 35 Richmond St., Blackburn, Victoria, Australia (3130)

Filed Apr. 28, 1976, Ser. No. 681,289
Claims priority, application Australia, Apr. 30, 1975, PC1410
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **15 Claims**



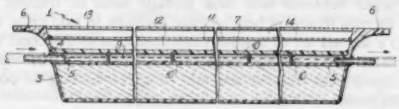
1. A solar fluid heater including a plurality of elongated solar heating elements formed by extrusion and positioned in a sealed tray for exposure to the sun; each of said heating elements comprising a tube for receiving and passing the fluid to be heated, a pair of fins of similar dimensions integrally formed with said tube and extending in a generally radial direction from the exterior of the tube to subtend a predetermined angle therebetween, said fins having a dimension in the generally radial direction sufficient to support the element on the bottom of the tray while spacing said tube from the bottom of the tray, complementary formation connection means carried by the free ends of said fins for connecting adjacent elements together in a generally parallel unitary configuration, said complementary formation connection means comprising a rod mounted at the free edge of one of said fins and running parallel to said fluid passage tube, and a second tube mounted at the free edge of the other of said fins and running parallel to said fluid passage tube for embracing the rod of an adjacent element, said second tube having a peripheral portion cut away for receiving the one of said fins of said adjacent element when the rod thereof lies in said second tube, and manifold means connecting the ends of said tubes for passing fluids down said tubes.

4,114,599

SOLAR COLLECTOR

James W. Stephens, 1681 Tilling Way, Stone Mountain, Ga. 30082

Filed Jan. 13, 1977, Ser. No. 759,019
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. Solar energy collection means, comprising

(a) energy absorber plate means including

(1) a relatively thin sheet formed or a heat conducting metal;

(2) a layer of solar-energy-absorbing pigment material coated upon at least one face of said metal sheet;

(3) a layer of transparent synthetic resinous plastic material completely encapsulating said coated metal sheet; and

(4) a plurality of flow plates each formed of a heat conductive material; said flow plates being in-heat transmitting engagement at one end with said heat conductive sheet, said flow plates extending completely through and protruding at their other end beyond said layer of transparent material; and

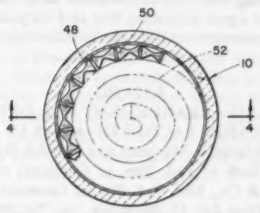
(b) means for directing a heat-exchange fluid in contact with the protruding end portions of said flow plates, respectively, whereby when the coated surface of said sheet is arranged to face a source of solar energy, the rays of solar energy are transmitted to said solar-energy-absorbing layer to heat the sheet, and the heat is then transmitted to said heat exchange fluid via said flow plates.

4,114,600

THERMAL STORAGE AND HEAT TRANSFER SYSTEM AND METHOD

Alwin B. Newton, York, Pa., assignor to Solation Products, Inc., York, Pa.

Filed Oct. 6, 1976, Ser. No. 730,212
Int. Cl.[2] F28D *21/00;* F24J *3/02*
U.S. Cl. 126—271 **17 Claims**



1. A thermal storage and heat transfer system to utilize solar energy as the source of heat comprising in combination:

(a) a tank having first and second sets of inlet and discharge ports adjacent opposite ends of said tank,

(b) a plurality of heat storage cells of irregular shape formed from heat-sealable flexible thermoplastic tubular material transversely sealed at longitudinally spaced locations along said tube sequentially along transverse lines at right angles to each other to provide external passages in all directions therearound when said cells are compactly positioned immediately adjacent each other within said tank due to the irregular shapes thereof,

(c) heat storage medium sealed within said cells and com-

prising a chemical capable of changing between liquid and solid state to develop latent heat of fusion temperature,

(d) a first set of fluid conduits connected respectively to said ports of said first set in said tank and adapted to be connected to a solar heat collector to receive heat therefrom,

(e) a pump connected in one of said conduits,

(f) a liquid heat transfer medium contained in said tank and adapted to be circulated by said pump through said passages between said heat storage cells to transfer heat thereto from the heat storage medium in said cells, and

(g) a second set of conduits attachable to said second set of inlet and discharge ports in said tank to distribute said liquid heat transfer medium to space heating or cooling systems.

4,114,601

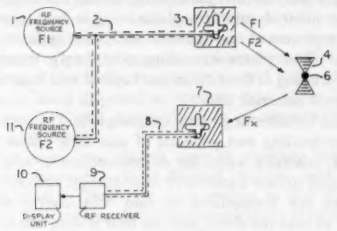
MEDICAL AND SURGICAL IMPLEMENT DETECTION SYSTEM

Michael Allen Abels, Miami, Fla., assignor to Micro Tec Instrumentation, Inc., Miami, Fla.

Filed Aug. 9, 1976, Ser. No. 712,883

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **1 Claim**



1. A method of detecting surgical and therapeutic articles or materials within the human body comprising: constructing at least a portion of said articles or materials as a transponder capable of non-linearly mixing two or more radio frequency signals impinging thereon, to thereby generate and reradiate a higher order product frequency; directing two or more radio frequency signals toward the portion of the human body to be investigated; placing a receiving means in the vicinity of said investigated portion to detect and visually or audibly indicate the presence of and reradiated higher order product frequency signal emanating from the investigated area; the existence of said reradiated signal indicating that said surgical or therapeutic article or material is within the human body.

4,114,602

PROCESS AND ARRANGEMENT FOR DETERMINING THE PERFUSION FACTOR OF A GAS IN A SAMPLE

Albert Huch, Marbach, Marburg, and Dietrich Werner Lubbers, Dortmund, both of Fed. Rep. of Germany, assignors to L. Eschweiler & Co., Kiel, Fed. Rep. of Germany

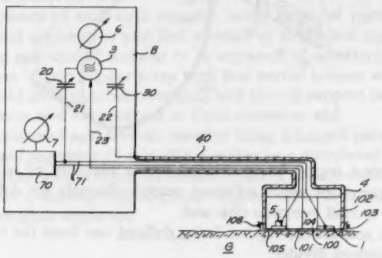
Filed Jul. 12, 1976, Ser. No. 704,295

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530834

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 E **9 Claims**

1. A device for determining the perfusion factor of a gas carried in blood perfused in animal tissue, the device comprising, in combination, a sensor unit adapted to be placed against the animal tissue, the sensor unit including a metallic reference electrode having a flat surface adapted to be placed against the animal tissue and defining a measuring surface, a sensor electrode located at said measuring surface, means including an electrolyte establishing electrolytic contact between the metallic reference electrode and the sensor electrode, and a metallic diathermy electrode structure including a portion located at said measuring surface; polarographic measuring means connected across the reference and sensor electrodes and operative for establishing a potential difference thereacross and performing a polarographic measurement and indication of the concentration of the gas of interest; a controllable-output-power high-frequency voltage sources means having one output terminal electrically connected to the metallic reference electrode and another output terminal electrically connected to the metallic diathermy electrode structure and operative for establishing between the reference electrode and the diathermy electrode structure a high-frequency dielectric heating field operative for diathermally generating heat within dielectric constituents of the tissue against which the sensor unit is placed; means operative for sensing the temperature of the metallic reference electrode in order to detect transfer of heat from the diathermally heated tissue to the reference electrode, and in dependence upon the sensed temperature electrode, and in dependence upon the sensed temperature of the reference electrode automatically adjusting the high-frequency voltage source means to maintain the temperature of the reference electrode constant at a predetermined value; and means for indicating the heating power supplied by the high-frequency voltage source means.



4,114,603

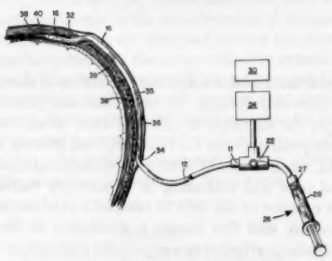
INTRACRANIAL PRESSURE MONITORING CATHETER

Harold A. Wilkinson, 330 Brookline Ave., Boston, Mass. 02215

Filed Aug. 6, 1976, Ser. No. 712,132

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 R **7 Claims**



4. An intracranial pressure monitoring catheter comprising:

a flexible distal portion having flat front and back surfaces;

a cup-like recess open at said front surface;

a sealing surface defined by said flat front surface about said recess; and

a lumen in said distal portion in communication with said recess for providing a fluid couple to a pressure measuring device;

said catheter being operable to be placed in the patient's subdural space with the patient's dura mater in contact with said back surface and with said sealing surface in

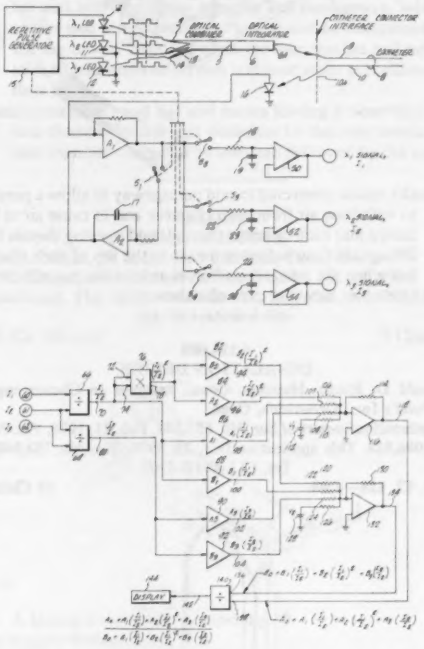
contact with the patient's arachnoid membrane, whereby the arachnoid membrane functions as a pressure sensing diaphragm and a fluid couple may be maintained between the patient's arachnoid membrane and a pressure measuring device.

4,114,604

CATHETER OXIMETER APPARATUS AND METHOD

Robert F. Shaw, 135 Willowbrook Dr., Portola Valley, Calif. 94025, and John M. Sperinde, 6582 Canterbery Ct., San Jose, Calif. 95129

Filed Oct. 18, 1976, Ser. No. 733,278
Int. Cl.[2] G01N *33/16*
U.S. Cl. 128—2 L **19 Claims**



1. Apparatus for determining oxygen saturation of blood comprising:

source means for producing electro-magnetic radiation at first, second and third radiation wavelengths;

means coupled to the source means for supplying the radiation therefrom to blood under test with incident intensities at the respective wavelengths;

detector means disposed to receive radiation from the blood under test altered from the incident intensities of the respective wavelengths by the optical properties of the blood under test for producing signals representative of the intensities of the radiation received thereby at the respective wavelengths;

circuit means coupled to the detector means for producing a first output representative of the ratio of a first pair of the signals from said detector means, and for producing a second output representative of the ratio of a second pair of the signals from said detector means, the wavelengths of the radiation from said source means being such that the first ratio is independent of physiological changes of the sample blood other than oxygen saturation at a first oxygen saturation level and the second ratio is independent of physiological changes other than oxygen saturation at a second oxygen saturation level; and

first means coupled to the circuit means for receiving the first and second outputs of said circuit means and applying selected coefficients thereto to minimize the effect of varying physiological characteristics of the blood under test other than oxygen saturation, said first means producing an output representative of the algebraic combination of selectively weighted first and second outputs of said circuit means; and

second means coupled to the circuit means for receiving the first and second outputs of said circuit means and applying selected coefficients thereto to minimize the effect of varying physiological characteristics of the blood under test other than oxygen saturation, said second means producing an output representative of the algebraic combination of selectively weighted first and second outputs of said circuit means; and

means coupled to the first and second means for receiving the outputs therefrom and producing an output manifestation of the ratio of the outputs from the first and second means.

4,114,605

INTRAORAL CUP FOR COLLECTING SALIVA AND METHOD OF USING THE SAME

Jerry R. McGhee, Birmingham, Ala., and Milton E. Schaefer, Pasadena, Calif., assignors to University of Alabama in Birmingham, Birmingham, Ala.

Filed Nov. 2, 1976, Ser. No. 738,042
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 F **3 Claims**

2. An intraoral cup for collecting the secretion of the parotid gland which comprises

a flat side having an aperture in it substantially offset from its center and

a saucer shaped resilient side without an orifice, sealed on its periphery to the periphery of the flat side, its resilence providing means for sustaining negative pressure within the cup when the cup is placed against the inside of a subject's cheek with the aperture over Stenson's duct and the cup is compressed momentarily and released, said cup being of a size to fit comfortably inside a person's cheek.

4,114,606

MONITORING APPARATUS FOR RESONANT CIRCUIT INTRACRANIAL PRESSURE IMPLANTS

George R. Seylar, Clarksville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 12, 1976, Ser. No. 741,231
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 E **6 Claims**

1. Apparatus for monitoring an implanted circuit means whose resonant frequency provides indication of a selected physiological activity, comprising:

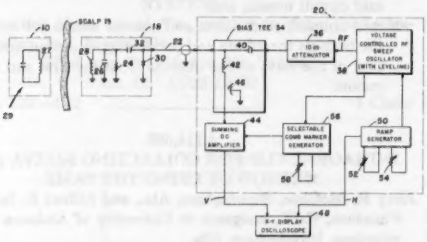
an RF sweep frequency generator means for generating an output RF signal whose frequency varies in a predetermined manner throughout an operating frequency range encompassing the resonant frequency of said implanted circuit means,

a transmission line having one input end connected to receive the RF signal from said sweep frequency generator means, said transmission line having a predetermined characteristic impedance,

a resistance means connected across the opposite output end of said transmission line and having a resistance value matching the characteristic impedance of said transmission line to minimize the standing wave ration of said transmission line,

a parallel resonant inductor-capacitor circuit connected across the output end of said transmission line in parallel with said resistance means and adapted to be brought into coupling relationship to said implanted circuit means,

said parallel connected resistance means and resonant circuit producing a constant broadband response throughout the operating range of said RF sweep frequency generator



and a constant value RF voltage across said parallel resonant circuit when not coupled to said implanted circuit means,

a maximum energy transfer occurring between said parallel resonant circuit and said implanted circuit means, when coupled, when the output signal generated by said RF sweep frequency generator corresponds to the resonant frequency of said implanted circuit means, said maximum energy transfer resulting in a minimum value RF voltage being produced across said parallel resonant circuit denoting the resonant frequency of said implanted circuit means,

detector means for converting the RF voltage appearing across said parallel resonant circuit to a corresponding DC voltage, and

indicator means responsive to the value of said DC voltage.

4,114,607

INHALATION DEVICE

Ronald D. Russo, Hamden, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 657,242, Feb. 11, 1976, Pat. No. 4,060,074. This application Dec. 23, 1976, Ser. No. 753,839

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—2.08 **15 Claims**

1. An incentive inhalation device for inducing respiratory exercise, comprising:

a container having a plurality of see-through compartments therein, in each of which is a chamber,

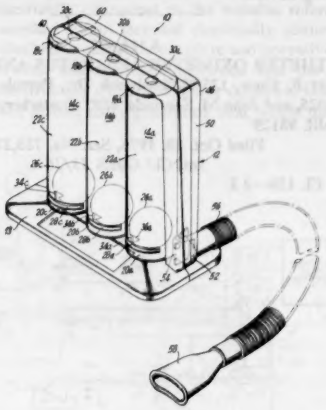
flow rate indicator means in each chamber which normally rests in the lower portion thereof and having a clearance between each indicator means and its chamber wall which allows free movement of the indicator means but restricts air flow thereabout to cause said indicator means to rise towards the top of its chamber when the inhalation effort by a patient reaches a precalibrated rate of air flow,

an opening in the lower portion of each chamber connecting the chamber, to the surrounding atmosphere for lifting the flow indicator means therein,

an opening in the top portion of each chamber,

means associated with at least one member selected from the group consisting of said flow rate indicator means, said chambers and said openings to provide a precalibrated rate of flow for lifting said indicating means in said chambers which is different for at least two of said chambers,

a passageway connected to each chamber through said opening in the top portion of each chamber, and



outlet means connected to said passageway to allow a person to withdraw air from each chamber and to cause air to be drawn into each chamber through said opening therein for lifting said flow indicator means to the top of each chamber when the inhalation effort is at least the precalibrated rate of air flow for each chamber.

4,114,608

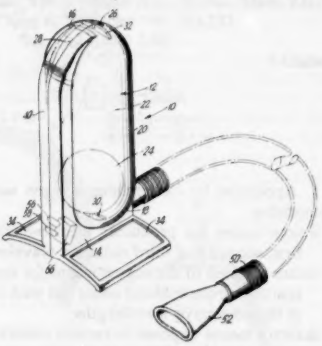
INHALATION DEVICE

Ronald D. Russo, Hamden, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 657,241, Feb. 11, 1976, Pat. No. 4,086,918. This application Dec. 23, 1976, Ser. No. 753,840

Int. Cl.[2] A61B *5/08*

U.S. Cl. 128—2.08 **15 Claims**



1. A self-supporting incentive inhalation device for inducing respiratory exercises comprising:

a container, having a front and back portion, a top wall and a bottom wall and an intermediate see-through wall forming a chamber within said container which extends between said top and bottom walls,

a light-weight article in said chamber normally at the bottom thereof, but which, upon inhalation by the user at a precalibrated flow rate, will rise towards the top thereof,

an opening extending through the upper portion of said container and into said chamber wherein air flows through said opening from the upper portion of said chamber upon inhalation,

an opening extending through the lower portion of said container and into said chamber to open said chamber to atmosphere, and wherein air flows from atmosphere through said opening into the lower portion of said chamber for lifting said article upon inhalation,

an inhalation passageway integral with said device wherein said passageway extends from the front and bottom of said container and up along the back of said container and being formed by the surface of said walls adjacent said passageway and a channel integral therewith, and, where at its upper end, said passageway is connected to said upper opening, and

means connected to said passageway at the front and bottom of said container to allow a person to withdraw air from said chamber to cause atmospheric air to flow into the chamber through said lower opening, through said chamber and into said upper opening and passageway, which causes said article therein to rise to and be maintained at the top of said chamber when the user reaches and maintains an inhalation effort that is at least at the precalibrated flow rate,

said passageway and last said means leaving a clear view of said chamber within said container so that said article in said chamber easily can be seen and followed by the user.

4,114,609

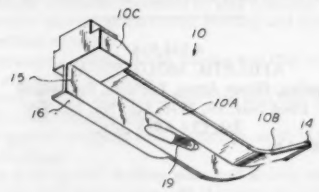
LARYNGOSCOPE

John A. Moses, 30 Kalan Cir., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 596,356, Jul. 16, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,427

Int. Cl.[2] A61B *1/06*

U.S. Cl. 128—11 **3 Claims**



1. A laryngoscope blade comprising:

a straight blade portion,

said straight blade portion terminating in an inner end portion which angles out of the plane of said straight blade portion in a Y axis of the blade a distance ranging between 1.5 to 2 cms.,

said inner end portion extending along the X axis of the blade a distance ranging between 3 to 5 cms., whereby said inner end portion can be inserted into a vallecular groove so as to cause anterior movement of the hyoid bone in the operative position of said laryngoscope blade to effect anterior displacement of the epiglottis to expose the inlet of the larynx,

said straight blade portion compressing the tongue whereby the co-action between said straight portion and angled inner end acting on said tongue and hyoid bone and connected epiglottis respectfully defines a straight wide angle line of sight directly into the larynx,

a lateral wall connected along one edge of said straight blade portion,

a lateral shelf connected to the other end of said lateral wall,

said lateral shelf extending in a direction opposite to said straight blade portion whereby said straight blade portion and shelf portion are disposed in substantially spaced apart parallel planes.

4,114,610

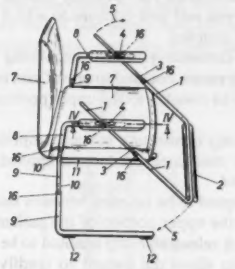
KNEE BENDING DEVICE

Guido Koch, Andreasstrasse 15, 6580 Idar-Oberstein, Germany

Filed Jan. 21, 1977, Ser. No. 761,201

Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—25 R **8 Claims**



1. A knee bending device comprising a chair including a back support and arm rests, and a U-shaped stirrup including two substantially parallel limbs and a connecting central bar, said parallel limbs being swingable about pivots which are adjustably mounted in said arm rests, said pivots on the parallel limbs being between the ends thereof such that extensions of said limbs above the arm rests comprise hand-actuated lever arms, whereby a patient seated in said chair can exert knee bending pressure on his feet and/or legs by pressing the lever arms forward and thereby forcing the central bar downwardly.

4,114,611

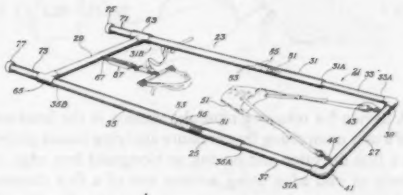
TRACTION DEVICE

Judge M. Lyle, 3901 Westcliff Rd. South, Fort Worth, Tex. 76109, and Jon W. Eberle, 7715 Rolling Acres, Dallas, Tex. 75248

Filed May 9, 1977, Ser. No. 795,326

Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—75 **2 Claims**



1. A traction device for patients comprising:

a portable frame adapted to be fitted about a patient while lying down,

said frame comprising two side members and two end members,

each side member comprising a tubular member having a second member slideably located therein and extending out of a first end thereof,

each of said second members of said side members having an end connected to one of said end members,

each of said tubular members having a second end opposite said first end thereof connected to the other of said end members,

each of said end members having connecting means adapted to be coupled to the patient's body at two different positions respectively when said frame is fitted about the patient,

removable means located in each of said tubular members,

said removable means in each tubular member having a first

end spaced from said second member and a second end adapted to engage said second end of said tubular member,

biasing means located in each of said tubular members between its second member and its removable means for biasing its second member and its removable member in opposite directions for biasing said two end members in opposite directions for applying tension to the patient's body between said two portions to which said connecting means are coupled,

one of said connecting means comprising an upper body connecting means coupled to one of said end members and adapted to be coupled to the upper portion of the patient's body,

said upper body connecting means comprising:

a scale for measuring the tension applied to the patient's body, and

a strap adapted to be coupled between said one end member and the upper portion of the patient's body by way of a quick releaseable clip adapted to be operated by the patient to allow the patient to readily disconnect the upper portion of the patient's body from said one end member to release the tension.

4,114,612

TENSION RELIEVING DEVICE

Ben E. Benjamin, 910 W. End Ave. at 105th St., Apt. 15F, New York, N.Y. 10025

Filed Oct. 26, 1976, Ser. No. 735,370

Int. Cl.[2] A61F *5/01*

U.S. Cl. 128—76 R **5 Claims**

1. A device for releasing muscular tension in the head-neck area of a user comprising first pressure applying means projecting in a first direction and having an elongated free edge, the periphery of said edge being arcuate and of a first diameter, second pressure applying means projecting in a direction displaced 120° from said first pressure applying means, said second pressure applying means having an elongated free edge, the periphery of which is arcuate and of a second diameter, said second diameter being smaller than said first diameter, third pressure applying means projecting in a direction displaced 120° from said second pressure applying means and said first pressure applying means, said third pressure applying means having an elongated free edge, the periphery of which is of a third diameter, said third diameter being smaller than said second diameter, each of said pressure applying means including an edge disposed opposite to its free edge being disposed adjacent to one another, said pressure applying means being secured to one another by a pair of end members, said end members being of triangular shape, said device being adapted to be supported in position such that the free edge of either the first, second or third pressure applying means is in contact with the occipital area of the user to apply concentrated pressure to the muscles at said contact area to effect the relaxation of tension from said muscles.

4,114,613

FOOT REST

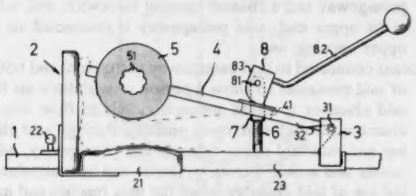
Margrit Kuhn, Bannholzstrasse 12, Vaduz, Liechtenstein (FL-9490)

Filed Jan. 13, 1977, Ser. No. 758,842

Claims priority, application Switzerland, Nov. 17, 1976, 14462/76

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—80 R **11 Claims**



1. A foot rest comprising:

a frame; foot support means attached to said frame; an arm having two ends and positioned approximately parallel to said frame, one of said ends being in juxtaposition to said foot support means and the other of said ends being pivotally connected to said frame at a location remote from said foot support whereby said one is movable toward and away from said foot support means; pressure pad means attached to said arm adjacent said one end and movable with said arm toward and away from said foot support means; pressing means interconnecting said frame and said arm for selectively urging the arm and pressure pad means to pivot towards the foot support means; and spring means bearing against the frame and against the arm for biasing the arm for pivotal movement away from the frame.

4,114,614

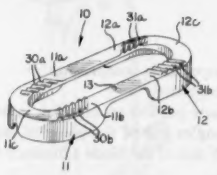
ATHLETIC MOUTHGUARD

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Filed Nov. 19, 1976, Ser. No. 743,303

Int. Cl.[2] A61F *5/56*

U.S. Cl. 128—136 **2 Claims**



1. A one-piece athletic mouthguard of resilient material for protecting the mouth of a wearer comprising, a pair of allochiral arch-shaped members, hinge means interconnecting said members at the distal ends thereof in end-to-end relation, each said arch-shaped member including a base portion having an inside surface adapted to be engaged by the occlusal surfaces of the teeth of a wearer and an outside surface adapted to face and/or engage the outside surface of the other arch-shaped member when the mouthguard is in position in the mouth of a wearer, each base portion including a front section and opposed substantially parallel side sections, means on the outside surfaces of the side sections of said base portions coacting during engagement of said outside surfaces to transmit forces between said members and to interlock said members against relative sliding movement therebetween, said means including a plurality of parallel ridges on the side sections extending about 45° to said side sections, the ridges on one side section of a base portion extending in a direction opposite to the ridges on

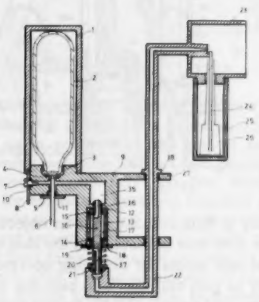
the other side section thereof, an upstanding portion at the labiobuccal edge of said base portion for overlying the labiobuccal surfaces of the teeth and any appliances mounted thereon, and an upstanding guide flange at the lingual edge of the base portion in the area of the anterior teeth.

4,114,615

AEROSOL INHALATION DEVICE

Kjell Ingvar Leopold Wetterlin, Sandby, Sweden, assignor to Aktiebolaget Draco, Sweden

Filed Dec. 10, 1976, Ser. No. 749,327
Claims priority, application Sweden, Dec. 12, 1975, 7514066
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—173 R **7 Claims**



1. An aerosol inhalation device for dispensing unit dosages of medication, comprising:

a housing;

a propellant container mounted to said housing;

a protective case mounted to said housing and enclosing said propellant container;

a first passage in said housing having one end connected to said propellant container;

an opening in said housing connecting said first passageway to the outer surrounding;

a locking plate retaining said protective cover in position on said housing;

a screw holding said locking plate and sealing said opening between said first passage and the outer surrounding;

an inhalation outlet;

a second passage having one end opening in said inhalation outlet;

a valve connected between the outer ends of said first and second passages and including a metering chamber means for alternately connecting said metering chamber with said first and second passages on operation of said valve;

and a medication container for holding a unit dose of said medication having an outlet an communication with said one end of said second passage to cause propellant flowing through said second passage to propel said medication into said inhalation outlet.

4,114,616

POSITIVE REINFORCEMENT RESPIRATORY INHALATION DEVICE

Peter Nelson Brawn, 1711 26th Ave., Seattle, Wash. 98112

Continuation of Ser. No. 684,424, Jun. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 542,795, Jan. 21, 1975, Pat. No. 3,972,326, which is a continuation-in-part of Ser. No. 435,877, Jan. 23, 1974, abandoned. This application Sep. 16, 1977, Ser. No. 833,960
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—210 **14 Claims**

1. A positive reinforcement respiratory inhalation device, including provision for controlled ingestion of liquid into the mouth of a user, comprising in combination:

a container having a side wall portion and a bottom wall portion for holding said liquid, said container having an upper part thereof open to ambient pressure;

a tube assembly including a lower tube having one end affixed at the bottom wall portion of said container and the other end extending to the approximate height of said container and an upper tube having one end slideably coupled to and concentric with said lower tube other end and the other end of said upper tube extending exteriorly of said container, said upper and lower tubes, in concentric relationship including an unobstructed passage therethrough;

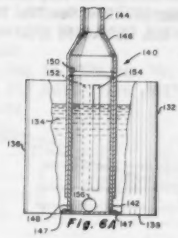


Fig. 6A

said tube assembly being provided with an opening in a wall portion thereof adjacent said one end of said lower tube; and

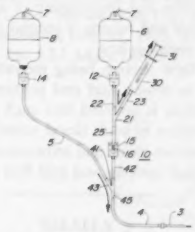
at least one of said upper and lower tubes being provided with at least one opening in a side wall portion thereof at least adjacent the height of said side wall whose aperture is adjustable by slideably moving said upper tube relative to said lower tube.

4,114,617

APPARATUS FOR INFUSION OF A MEASURED VOLUME OF BLOOD

Thomas D. Turner, 1120 Warm Springs Ave., Boise, Id. 83702, and Alan R. Benson, 3465 Minuteman Way, Boise, Id. 83706

Filed Feb. 28, 1977, Ser. No. 772,686
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 R **5 Claims**



1. In a system for administering two parenteral fluids including a first solution container and a second fluid container, apparatus for dispensing accurately measured amounts of solution from the first container, comprising:

a first check valve connected at its proximal end to the first solution container;

a calibrated syringe and plunger;

a first Y-connector having a first and second inlet conduit and a common outlet conduit, said first inlet conduit connected to the distal end of said first check valve, said second inlet conduit connected to said syringe;

a force operative check valve connected at its proximal end to said common outlet conduit of said first Y-connector;

a second check valve connected at its proximal end to the second fluid container;

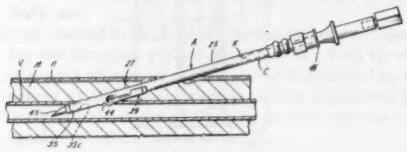
a second Y-connector having a first and second inlet conduit and a common outlet conduit, said first inlet conduit connected to the distal end of said force operative check valve, said second inlet conduit connected to the distal end of said second check valve and said common outlet adapted to communicate with a needle.

4,114,618

CATHETER ASSEMBLY

Jorge J. Vargas, 9106 Bonhomme Rd., Houston, Tex. 77074

Filed Dec. 15, 1976, Ser. No. 750,740
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 **9 Claims**



1. A catheter assembly for insertion into a blood vessel for intravenous injection of medicinal fluid, comprising:

an introducing needle having a point on a first end thereof for insertion into a blood vessel;

a hollow catheter tubular unit slidably mounted over said introducing needle for insertion into such blood vessel with said introducing needle, said hollow catheter tubular unit including a main, flexible hollow body section having a main bore therethrough, said main, hollow body section terminating in an insertable end portion at one end for insertion into said blood vessel and in a connector at the other end thereof for connection to an intravenous fluid supply after removal of said introducing needle;

said insertable end portion including flow means insertable into said blood vessel for delivering medicinal fluid from said main bore into such blood vessel while allowing for substantially uninterrupted flow of blood through such blood vessel, said insertable flow means including:

said end portion including a first end section having an end in fluid communication with said bore of said main body section and terminating in a first opening at the end thereof and having a second opening spaced from the first opening; and

a foldable flow section being movable between a folded position in which said end portion with said foldable flow section is inserted into such blood vessel and an open position in such blood vessel in which said flow section allows blood and intravenous fluid flow through said second opening and said first opening.

4,114,619

AUTOMATIC INJECTING APPARATUS

Wolfgang Wagner, Exerzierstrasse 1, 1 Berlin 65, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 634,741, Nov. 21, 1975, abandoned. This application May 5, 1977, Ser. No. 793,951
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 **12 Claims**

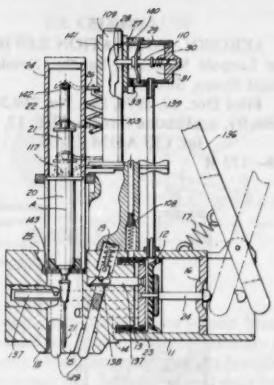
1. An injecting apparatus comprising

a housing formed with a recess having an annular rim engageable with the skin of a person to be injected to form therewith a substantially closed injecting compartment;

a hypodermic syringe on said housing having a needle tip in said recess and means including an actuation element displacement to eject a liquid from said tip;

means on said housing including at least one aspiration member displaceable for aspirating air from said recess, whereby when said rim is in firm contact with the skin of a person to be injected such aspiration pulls such skin into said recess into piercing contact with said needle tip; and

means for detecting when said rim is generally completely in firm contact with an object for displacing said actuation element and said aspiration member only when said rim is



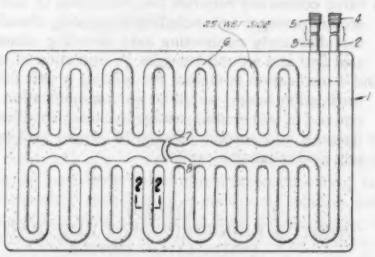
generally in firm contact with an object, whereby when said rim is in firm contact with the skin of a person to be injected said means for detecting operates said aspiration member to pull said skin into piercing contact with said needle tip and operates said actuation element to eject said liquid from said tip into said skin.

4,114,620

PATIENT TREATMENT PAD FOR HOT OR COLD USE

Francis Claudell Moore, and Leon Raymond Perkinson, both of Indianapolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.

Filed Mar. 2, 1977, Ser. No. 773,673
Int. Cl.[2] A61F 7/00
U.S. Cl. 128—254 **13 Claims**

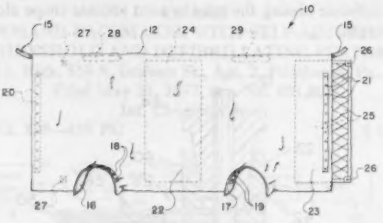


1. A patient treating pad for wet or dry use comprising: a pair of superimposed film panels with inner surfaces joined together at selected locations to define a fluid circulating path between the film panels; a patient contact panel secured at a surface to surface bond to one of the film panels; and said patient contact panel has an outer patient contact surface of exposed elongated liquid absorptive means selected from the group consisting of fibers and filaments that extend into a central portion of the patient contact panel and are anchored to the film panel at the surface to surface bond.

4,114,621
COMBINATION INCONTINENT GARMENT AND LINER

Carl C. Mims, Jr., 311 Brainard Ave., Fayetteville, N.C. 28301

Filed Dec. 7, 1976, Ser. No. 748,319
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—288 6 Claims

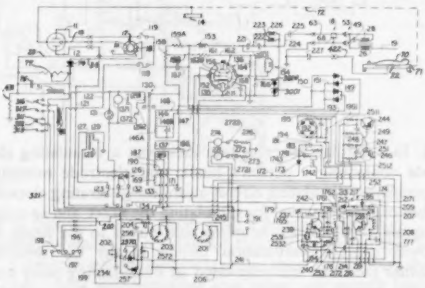


1. A combination incontinent garment and liner comprising: a generally rectangular shaped basic garment; a pair of space arcuate shaped open portions in one end of said garment; means for releasably securing said arcuate portions together when said garment is wearingly wrapped about a wearer thereof; means for releasably fastening together the opposed edges of said garment which are perpendicular to the edge incorporating said arcuate portions; a generally 8-shaped absorbent garment liner to give a greater absorbent area on either side of the crotch with a reduced amount of material being provided in such crotch area; said liner including a generally moisture impervious backing layer, at least one absorbent layer, and a moisture transfer layer; said backing and said absorbent layers being folded into at least one tuck so as to form a moisture retaining reservoir with the moisture transfer layer being unfoldingly disposed thereover whereby a smooth surface is presented to the body of the wearer.

4,114,622
ELECTROSURGICAL DEVICE

Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research and Development Corporation, Milford, Del.

Division of Ser. No. 592,480, Jul. 2, 1975, Pat. No. 3,987,796, which is a division of Ser. No. 461,983, Apr. 18, 1974, Pat. No. 3,905,373. This application Jun. 1, 1976, Ser. No. 691,631
The portion of the term of this patent subsequent to Sep. 16, 1992, has been disclaimed.
Int. Cl.[2] A61B *17/36;* A61N *3/02*
U.S. Cl. 128—303.14 3 Claims

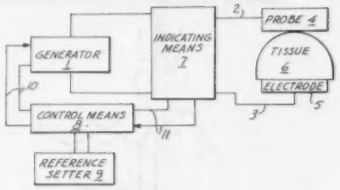


1. In combination with a radio-frequency electrosurgical device which includes a radio-frequency generator, circuit means connected to the radio-frequency generator for performing electrosurgery on a patient, said circuit means establishing a primary current return for substantially all the current passing from the patient to the radio-frequency generator when connected to the patient, means for establishing an alternate current return for at least part of said primary current return from the patient to the radiofrequency generator, and a monitoring system means connected to the alternate current return for sensing radiofrequency current passing in said alternate current return.

4,114,623
CUTTING AND COAGULATION APPARATUS FOR SURGERY

Hans Heinrich Meinke, Gauting; Gerhard Flachenecker, Ottobrunn; Karl Fastenmeier; Friedrich Landstorfer, both of Munich, and Heinz Lindenmeier, Planegg, all of Fed. Rep. of Germany, assignors to Karl Storz Endoscopy-America, Inc., Los Angeles, Calif.

Filed Jul. 29, 1976, Ser. No. 709,610
Int. Cl.[2] A61B *17/36;* A61N *3/02*
U.S. Cl. 128—303.14 17 Claims

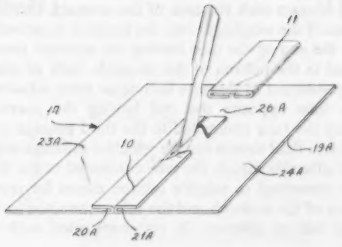


1. A method of regulating the current applied to a high-frequency current tissue-cutting device having a thin probe acting as one electrode, a second electrode, and a generator of high-frequency current applying said current to said electrodes, while cutting tissue which tissue has the property of steaming off when heated to high temperature, said method comprising: applying current and voltage of the generator to the electrodes to cause an arc to ignite and burn at the probe, detecting the existence of the arc and measuring its volume, and adjusting the current to the probe to maintain the arc at a predetermined volume.

4,114,624
SKIN CLOSURE MEANS

Charles B. Haverstock, 44 Frederick La., Glendale, Mo. 63122

Continuation-in-part of Ser. No. 442,784, Feb. 15, 1974, Pat. No. 3,933,158. This application Oct. 31, 1975, Ser. No. 627,832
Int. Cl.[2] A61B *17/08*
U.S. Cl. 128—335 31 Claims



29. Means for guiding the edge of an instrument comprising a relatively flexible sheet-like member having opposite surfaces, means forming an adhesive layer on one of said opposite surfaces, a pair of elongated uncovered, substantially continuous flange portions integral with and projecting from the other of said opposite surfaces, each of said flange portions having a surface which abuts a corresponding surface of said other flange portion, said abutting flange surfaces defining a substantially closed slit-like passageway extending therebetween, said

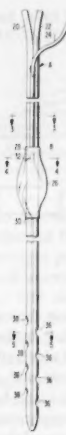
passageway extending completely through said sheet-like member along the length of the flange portions, said flange portions being of sufficient rigidity to receive and guide an instrument inserted between said flange portions.

4,114,625

ANTI-VOMITING, ANTI-ASPIRATING ORAL-NASAL GASTRIC TUBE

Mustafa V. Onat, Box 7, Saint George, Me. 04857

Filed Dec. 2, 1976, Ser. No. 746,778
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **4 Claims**



1. A flexible oral nasal gastric tube adaptable for insertion into the stomach of a patient through the esophagus comprising first and second independent parallel passages disposed within said tube and extending the entire length thereof, aperture means disposed only adjacent the end of the tube adapted to be inserted into the stomach for communicating the first and second passages with the stomach cavity, single annular inflatable means disposed about the periphery of said tube at a location spaced a substantial distance from said aperture means in said tube disposed in communication with the interior of said inflatable means; said inflatable means being spaced from said aperture means a substantial distance so that when said annular inflatable means is inflated within the stomach and disposed in sealing contact with the area of the stomach surrounding the entrance of the esophagus into the stomach to prevent regurgitation, the end of the tube having the aperture means will be disposed in the bottom of the stomach, each of said passages being connected to separate individual tubes adjacent the end of the tube opposite the end having the aperture means whereby the tube connected to the third passage can be connected to a fluid source for the selective inflation and deflation of said inflatable means, the tube connected to the first passage can be connected to suitable suction means for removing the contents of the stomach and the tube connected to the second passage can be disposed in communication with the atmosphere.

4,114,626

INTUBATION SET

Anthony V. Beran, 3802 Teakwood St., Santa Ana, Calif. 92707

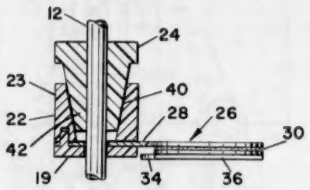
Continuation of Ser. No. 545,434, Jan. 30, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 759,181
Int. Cl.[2] A61M *25/02*
U.S. Cl. 128—348 **12 Claims**

1. For use in holding an apparatus in position in front of a subject's body opening:

fastening means in the form of a fastening element for holding said apparatus;

adhesive means in the form of a patch of flexible sheet material attached at one of its edges to said fastening means and being capable of adhering to an area of the subject's skin around that opening; and

a tube carried by said fastening means and having internal resilience biasing the tube toward arcuate shape along its length;



said fastening means being effective to hold said tube such that it extends through the plane of said patch;

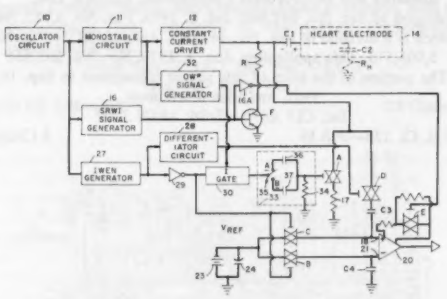
said fastening means comprising a sleeve formed with a bore through which said tube extends, and in which said patch extends sidewardly from one end of said sleeve and has a flexible connection to said sleeve whereby the patch can bend from a position in the plane perpendicular to the axis of said bore to tilted positions above and below said plane.

4,114,627

CARDIAC PACER SYSTEM AND METHOD WITH CAPTURE VERIFICATION SIGNAL

Lanny Louis Lewyn, Laguna Beach, and Glen David Simpson, Huntington Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 14, 1976, Ser. No. 750,574
Int. Cl.[2] H01N *1/36*
U.S. Cl. 128—419 PT **16 Claims**



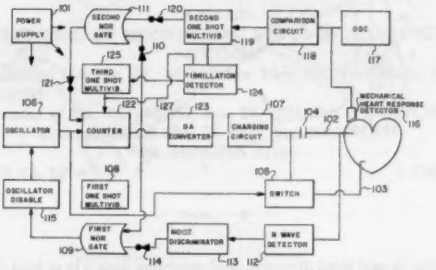
1. In a cardiac pacer system including a stimulating electrode contacting a person's heart, said electrode exhibiting capacitance; stimulating circuit means for generating electrical pulses of a first interval for stimulating the heart; and an output coupling capacitor for coupling said pulses to the heart; improved capture verification circuit means for detecting whether the heart has responded to a stimulating pulse comprising: amplifier means adapted to be coupled to said electrode through said output coupling capacitor for sensing a stimulated heart signal and generating a signal in response thereto; clamping circuit means including timing circuit means and first switching circuit means for connecting said output coupling capacitor to said clamping circuit means for a predetermined second time interval after said stimulating pulse has terminated and before said stimulated heart signal is to be sensed; and second switching circuit means for disconnecting

said amplifier means from said coupling capacitor when said stimulating pulse is generated and for reconnecting said amplifier means to said coupling capacitor after said predetermined second time interval and before a time period during which said stimulated heart signal is expected to be sensed.

4,114,628
DEMAND PACEMAKER WITH SELF-ADJUSTING THRESHOLD AND DEFIBRILLATING FEATURE

Nabil I. Rizk, 518 S. Graham St., Apt. 2, Pittsburgh, Pa. 15232

Filed May 31, 1977, Ser. No. 801,803
Int. Cl.[2] S61N *1/36*
U.S. Cl. 128—419 PG **8 Claims**

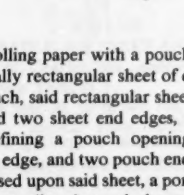


1. An implantable, external electrical cardiac pacer circuit comprising output means for delivering a stimulating pulse, oscillator means for triggering the output means, means responsive to electrical signals resulting naturally from a heart beat for disabling the oscillator means, means for detecting mechanical heart response in a refractory period following said stimulating pulse, and adjusting means responsive to the detected mechanical response for controlling the intensity of the next stimulating pulse to provide a desire mechanical response.

4,114,629
CIGARETTE ROLLING PAPER WITH INTEGRAL POUCH

Bruce Sedlacek, 4364 Wagman, Oak Forest, Ill. 60452, and Gus Stevens, Jr., 5707 S. Monitor, Chicago, Ill. 60638

Filed May 17, 1976, Ser. No. 687,047
Int. Cl.[2] A24D *1/02*
U.S. Cl. 131—15 R **10 Claims**



4. A cigarette rolling paper with a pouch comprising:

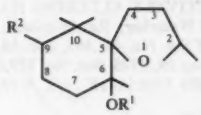
a thin, substantially rectangular sheet of cigarette paper and a separate pouch, said rectangular sheet having two sheet side edges and two sheet end edges, said pouch having two walls defining a pouch opening therebetween, a pouch bottom edge, and two pouch end edges, said pouch being superposed upon said sheet, a portion of said rectangular sheet extending beyond the pouch opening and defining a closure means for retaining a smoking substance within said pouch when said portion of said rectangular sheet is wrapped in a substantially cylindrical shape around said pouch to form a cigarette.

4,114,630
SPIRANE DERIVATIVES, THEIR USE AND PROCESS FOR PREPARING SAME

Walter Renold, Onex, Ge; Werner Skorianetz, Geneva; Karl-Heinrich Schulte-Elte, Onex, Ge, and Gunther Ohloff, Bernex, Ge, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 625,452, Oct. 23, 1975, Pat. No. 4,014,905, which is a continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,672
Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; Jun. 7, 1974, 7776/74; Jul. 30, 1975, 9920/75
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R **2 Claims**

1. A process for improving, enhancing or modifying the organoleptic properties of tobacco products which comprises adding thereto a spirane derivative of formula



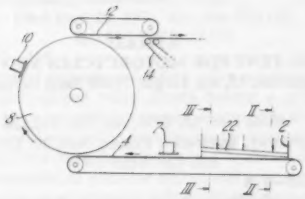
(II)

wherein the symbol R^1 repersents a hydrogen atom or an acyl radical containing from 1 to 6 carbon atoms and R^2 represents a hydrogen atom or a methyl radical.

4,114,631
CIGARETTE-MAKING MACHINES

Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France, and Ivan Yehudi Hirsh, London, England, assignors to Molins Limited, London, England

Filed Feb. 17, 1971, Ser. No. 115,952
Claims priority, application United Kingdom, Feb. 17, 1970, 7625/70
Int. Cl.[2] A24C *5/18*
U.S. Cl. 131—84 C **13 Claims**



10. Apparatus for forming a cigarette filler stream, comprising:

a. a substantially horizontal air-pervious conveyor band,

b. fixed elongated trough walls mounted above and along

opposite sides of the band and having substantially parallel inner surfaces extending perpendicularly from the band to a height which increases linearly at successive positions spaced along the band in the direction of movement of the band,

c. fixed chute walls extending upwards from the tops of the trough walls and diverging upwardly,

d. means defining a suction chamber below the band, and

e. means for delivering tobacco downwards on to and along the length of the band and towards the space between said trough walls at a rate sufficient to substantially fill the space between the trough walls at each position along the moving band, substantially directly in accordance with the increasing height of the tobacco stream as it builds up on the band during movement thereof.

4,114,632

METHOD OF SELECTIVELY ALTERING HAIR COLOR

Shila Morganroth, 1225 Waterbury Rd., Highland, Mich. 48031

Continuation-in-part of Ser. No. 481,695, Jun. 14, 1974. This application May 19, 1975, Ser. No. 579,012

Int. Cl.[2] A45D *7/04;* **A61K** *7/13, 7/135*

U.S. Cl. 132—7 **13 Claims**

4. A method of obtaining variegated colors in a head of human hair of medium brown or ligher which comprises parting the hair as it will be worn, forming at least one strand of hair by a polygonal parting at the scalp starting at the part line, applying liquid to each such strand capable of lightening the hair and leaving it in contact with the hair long enough to lighten it to the desired shade and then washing the excess lightening liquid from the hair.

7. The method of producing highlights in hair of medium brown or lighter color which comprises forming by parting a strand of hair of generally rectangular shape extending from the hair line at the face at least about one fourth of the way to the crown of the head and having a width within the range of about one half to one and one half inch, applying viscous spreadable off-the-scalp type bleach material through the strand from a starting position far enough from the scalp to prevent contact of the bleach material with the scalp to develop the desired highlight color in the strand, removing the said bleach material from the hair at such time and thereafter applying to said strand less viscous on-the-scalp type of bleach material from said starting position to the scalp to lighten it.

4,114,633

CAMPING TENT FOR MOTORCYCLES AND CYCLISTS

Francois Herbez, 15, rue Turgot, 78100 Saint Germain en Laye, France

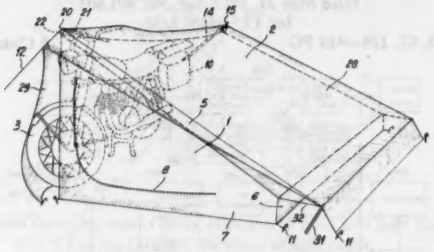
Filed Nov. 15, 1976, Ser. No. 742,124

Claims priority, application France, Nov. 20, 1975, 75 35514

Int. Cl.[2] A45F *1/00*

U.S. Cl. 135—1 A **12 Claims**

1. The camping tent to be associated with a vehicle, comprising an inner portion having and inner first roof section and a wall section and adapted to form, in an erected position of the tent, a closed first shelter for a user with said wall extending in an upright direction; an outer roof portion connected with said wall section and including a second roof section which extends in said erected position, from one side of said upright wall section in a first direction and above said first roof section of said inner portion so as to cover said inner portion from above and thereby to protect said first shelter for a user, and a third roof section which extends in said erected position from the opposite side of said upright wall section in a second direction which is opposite to said first direction and defines therewith a second shelter adapted to accommodate the vehicle and located outside of said first shelter for a user, said wall section and said inner portion each having a top edge extending in a third direction which is transverse to said first and second directions and having two end portions spaced from one another in said third direction; and mounting means in at least one of said top edges, arranged for mounting the tent on the vehicle so that the tent assumes its erected position in which it is supported by the vehicle so that said first shelter for the user is separated from said second shelter for the vehicle by said upright wall section, and the vehicle cannot be withdrawn from the tent by an unauthorized person without collapsing the tent, said mounting means including first and second mounting means which are spaced from one another in said third direction and arranged to support said first and second end portions of said one top edge, respectively, and to tension the tent in said third direction which is transverse to said first and second directions.



4,114,634

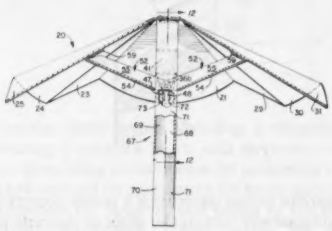
DISPOSABLE RAIN AND WEATHER PROTECTOR

Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 699,638, Jun. 24, 1976, Pat. No. 4,062,369. This application Sep. 22, 1977, Ser. No. 835,752

Int. Cl.[2] A45B *19/00*

U.S. Cl. 135—19.5 **7 Claims**



1. A disposable umbrella comprising a foldable canopy, foldable canopy support structure, and a collapsible canopy pole or column,

said canopy including

a pair of opposed major sections and

a pair of opposed minor sections

each major section being of relatively rigid sheet material having an inner face and an outer face and in the general

shape of a sector of a circle from which a segment has been removed near the projected junction of two radii,

each minor section including at least two portions each of which is generally in the shape of a sector of a circle and inwardly foldably connected to each other,

each major section being foldably connected on each of two sides to a side of a minor section,

the chords of the portions of each minor section being of less than one-half of the dimension of the chord of each major section

whereby, when the umbrella is folded, the canopy support structure and the canopy pole or column lie between the inward margins of folded minor sections and between the inner faces of the opposed major sections.

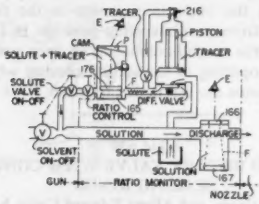
4,114,635
METHOD OF MONITORING RATIO OF FLOWING MIXTURE

Valentine Hechler, IV, 26 Meadow View Rd., Northfield, Ill. 60093

Division of Ser. No. 482,353, Jun. 24, 1974, Pat. No. 3,938,550. This application Jan. 26, 1976, Ser. No. 652,379

Int. Cl.[2] G01N *21/06*

U.S. Cl. 137—3 **1 Claim**



1. The method of mixing three fluids to determine the mixture ratio of two of them comprising,

homogenously mixing a primary mixture of a solute and a color tracer and flowing the mixture successively

(a) between the closer spaced set of two contiguous sets of portable parallel spaced transparent windows,

(b) mixing said primary mixture with a flowing solvent to provide a final mixture and conducting it between the other set of spaced parallel windows for comparison of its translucency color with the color translucency between the first set of parallel spaced windows,

(c) varying the amount of tracer in the primary mixture to optimize the comparison level,

(d) adjusting the spacing between one set of windows with respect to the spacing between the other set of windows to match the relative light transmissivities of the liquid mixtures disposed between the pairs of windows of the respective sets, and

indicating the mixture ratio of the solute and solvent in the final mixture by the adjusted ratio of the adjusted spacings between the respective sets of spaced windows.

4,114,636
BOTTOM OPERABLE AIR INLET AND OUTLET VALVE

Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

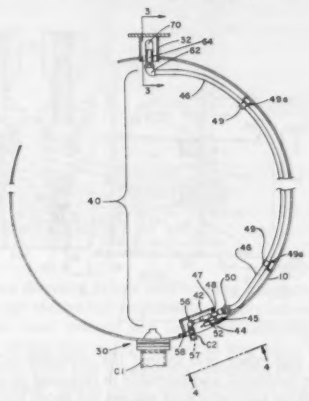
Filed Sep. 30, 1976, Ser. No. 728,343

Int. Cl.[2] F16K *17/36*

U.S. Cl. 137—43 **8 Claims**

1. A bottom operable air inlet and air outlet valve assembly located in a railway tank car for loading and unloading the car comprising:

a conduit extending within the car between the bottom of the tank and the top of the tank; a conduit bottom opening located in the conduit at the bottom portion of the tank; said conduit having air inlet and outlet valve means located at the bottom portion of the tank for opening and closing said bottom opening; a stilling well mounted inside the top of the tank, in fluid communication with said conduit; a ball made of light material mounted in the stilling well and located above the level in the tank corresponding to the fully loaded position of the lading in the tank; said stilling well including a seat for said ball, and openings allowing air and vapors to leave the tank through said conduit during loading of the tank to the fully loaded position when said ball is in an unseated position; and allowing air to enter said tank through said conduit and said openings during unloading of the tank when said ball is in said unseated position; said ball being



movable into a seated position in the stilling well which blocks fluid communication between said conduit and the inside of the tank, under impacts to the tank and when the car is traveling on an incline, and prevents lading from entering the conduit, whereby said seated ball prevents lading going down through the conduit to said air inlet and outlet valve means and discharging from the conduit when the operator opens said air inlet and outlet valve means, and whereby after the impact and/or traveling on an incline, said ball returns to an unseated position adapted for unloading even under full load and whereby it is unnecessary for the operator to climb to the top of the car to open said air inlet and outlet valve.

4,114,637
VARIABLE DIFFERENTIAL PRESSURE UNLOADING VALVE APPARATUS

Charles E. Johnson, Santa Ana, Calif., assignor to Double A Products Company, Manchester, Mich.

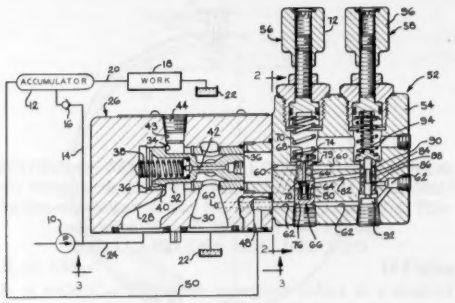
Filed Dec. 20, 1976, Ser. No. 752,103

Int. Cl.[2] G05D *16/10*

U.S. Cl. 137—116 **6 Claims**

1. Differential pressure unloading valve apparatus comprising a normally-closed valve means having a primary port adapted to be connected to a supply source of hydraulic fluid, a secondary port adapted to be connected to tank, and a poppet for blocking flow from the primary port to the secondary port until a pre-established pressure differential across a high pressure side and a lower pressure side of the poppet acts to move the poppet to a position to open communication between the primary and secondary ports; a normally closed upper limit differential pressure valve means having communication with said secondary port and the lower pressure side of said poppet, a valve member spring-actuated to a normal position for blocking communication from said lower pressure side to said secondary port and movable in response to a preselected pressure against the spring-action to an open position to allow communication from said lower pressure side to said secondary port

for venting said lower pressure side so as to allow said poppet to move to its open position, and a movable balancing piston operatively connected to said valve member and responsive to a differential pressure acting on one of its opposite ends to move said valve member against said spring action to its open piston, the other end of said piston being in communication with a pilot port adapted to be connected to an external source of hydraulic fluid under pressure such as to an accumulator connected to said supply source; and a lower limit differential pressure valve means having communication with (1) said lower pressure side of said poppet, (2) said pilot port and (3) the other end of said piston, and a spool spring actuated to a normal position for blocking communication with said lower pressure side while allowing communication between said pilot



port and said other end so that the pressures acting on said piston are balanced, and movable in response to a preselected pressure from said pilot port against the spool spring-action to a position for blocking communication with said pilot port and allowing communication between said lower pressure side and said other end so that the pressure on said other end is reduced when said lower pressure side is vented thereby to allow said piston to urge said valve member open; the spring characteristics of the spring-actuated valve member and the spring-actuated spool being such so that said valve member will open when the upper allowable limit of pressure from the supply source is reached and so that said spool will return to its normal position when the lower allowable limit of pressure from said external source is reached.

4,114,638

SAFETY CONNECTION DEVICE FOR INTERCONNECTING TWO PIPING ELEMENTS

Pierre Fournier, Noisy le Sec; André Jules Legleye, Vernouillet; Pierre Collé, Ozoir la Ferriere; Claude Michaut, Mennecy, all of France; Boris Petrovich Timofeev, Moscow, U.S.S.R.; Adolf Moritsovich Alexandrov, Moscow, U.S.S.R.; Ruben Dzhangirovich Balaian, Moscow, U.S.S.R.; Leonid Ozerovich Patik, Moscow, U.S.S.R.; Victor Leontjevich Berezovsky, Moscow, U.S.S.R., and Leonid Arkadjevich Matzkin, Moscow, U.S.S.R., assignors to Compagnie des Terminaux Marins Coterm, Paris, France and Spetsialnoe Konstruktorskoe Bjuro "Transnefteavtomatika", Moscow, U.S.S.R.

Filed Sep. 3, 1975, Ser. No. 609,903

Claims priority, application France, Sep. 3, 1974, 74 29915

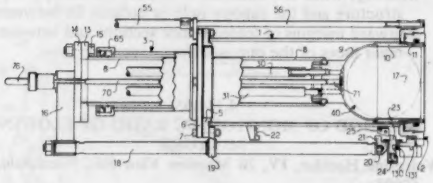
Int. Cl.[2] F16L *29/00, 37/28*

U.S. Cl. 137—242 **16 Claims**

1. Safety connection apparatus for coupling two piping elements together, the apparatus including a first piping element having a first cylindrical conduit with a front end and a rear end, a first connecting means at the front end of the first conduit, and a second conduit opening into the first conduit; a second cylindrical piping element having a second connecting means at one end adapted to sealingly assemble to the first connecting means; means for sealingly assemblying the second connecting means coaxially to the first connecting means; obdurating means mounted in one of the piping elements; and control means operable for moving the obdurating means selectively to open and shut a passage in said one element, wherein the improvement comprises:

said obdurating means being mounted in the first piping element and comprising a slidably movable piston having a front end and a rear end, the piston sealingly engaging the interior surface of the first cylindrical conduit;

said control means being mounted on the second piping element; and



operating means attached to the rear of the obdurating piston and extending through the rear end of the first cylindrical conduit, the control means being adapted to engage the operating means externally of the first piping element for moving the obdurating means in the first conduit selectively from an obdurating position in front of the opening of the second conduit to an open position to the rear of the opening of the second conduit when the two piping elements are assembled together.

4,114,639

LUBRICATED ROTARY VALVE WITH CONCENTRIC SEALING RINGS

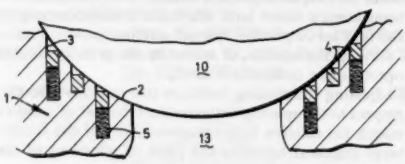
Michael Ellison Cross, and Albert Edward Coles, both of Bath, England, assignors to Cross Manufacturing Company (1938) Ltd., Bath, England

Continuation-in-part of Ser. No. 504,688, Sep. 6, 1974, Pat. No. 4,022,178. This application Dec. 27, 1976, Ser. No. 754,442

Claims priority, application United Kingdom, Sep. 7, 1973, 42105

Int. Cl.[2] F16K *5/06, 5/22*

U.S. Cl. 137—246.22 **6 Claims**



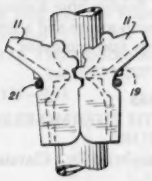
1. A rotary valve for controlling the flow of gases which rotary valve comprises a stationary valve housing defining an opening in the face thereof, leading to a combustion chamber and a movable member mounted for rotation in a bore defined by the said housing, said valve member having a face slidable over the face of the said housing and defining a port located in a part of the said face having a spherical conformation, which port is arranged to come into and out of communication with the said opening, means to supply lubricant between the two said faces, sealing means disposed to reduce the oil film thickness between the two said faces in the region of the port and opening when in communication to be in the region of from 40 to 50 μ-inches, the said sealing means comprising sealing rings each located in one of a series of grooves of successively decreasing diameter concentrically arranged about the opening in the face of the valve housing which grooves are formed substantially parallel to the axis of the said opening and means

to urge the sealing rings resiliently against the face of the movable valve member.

4,114,640
DRAIN VALVE

Hugh M. Forman, Waukesha, Wis., assignor to Will Ross Inc., Milwaukee, Wis.

Filed Jan. 10, 1977, Ser. No. 758,114
Int. Cl.[2] F16K *7/06*
U.S. Cl. 137—381 **12 Claims**



1. A valve assembly for use on the end of a resilient tube to control fluid flow within the tube comprising:

a pair of opposed, trough-like members, each member closed at a first end thereof and substantially open at a second end thereof and having an upstanding projection intermediate said first and second ends, said members being adapted to receive the end of said resilient tube therebetween and said projections being adapted to engage the wall of said resilient tube and collapse said tube, said members being movable from a closed position preventing flow through said tube to an open position permitting flow through said tube, said closed ends of said members coacting to enclose the end of said tube when said members are in said closed position; and

means for hingedly connecting said members in an opposed relationship, said hinging means being movable from a first position below said projections when said members are in said closed position preventing flow of fluid through said tube to a second position above said projections when said members are in said open position permitting flow of fluid through said tube, whereby the force on said projections by said tube biases said members to said closed position when said hinging means is at said first position and biases said members to said open position when said hinging means is at said second position to provide bistable operation of said valve assembly.

4,114,641
SEWAGE RELIEF VALVE

Howard Keith Robinson, 3220 Isabella Dr., Oceanside, Calif. 92054, and Larry Keith Robinson, 1361 Caren Rd., Vista, Calif. 92083

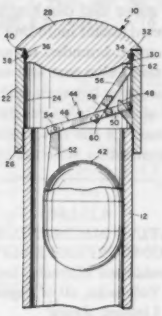
Filed Jul. 23, 1976, Ser. No. 708,202
Int. Cl.[2] F16K *31/20*
U.S. Cl. 137—430 **6 Claims**

1. A sewage relief valve, comprising:

a valve body having a generally cylindrical through-bore for mounting on an upwardly extending riser connected to a sewer line,

a cover sealingly detachably mounted on the upper end of said housing defining a valve member for sealing the upper end of said cylindrical through-bore,

lift linkage means including a unidirectional lift rod for engaging and lifting said cover from the end of said housing only in the opening, said lift rod disengaging from the cover in the closing direction,



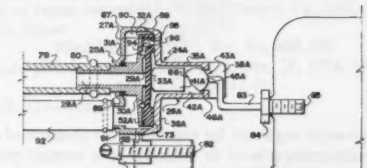
float means disposed below said housing connected to said lift linkage means and responsive to a predetermined rise in liquid level toward said cover for actuating said lift linkage means into engagement with said cover for lifting said cover from said housing and unsealing said bore, and

said lift linkage means being unidirectionally supported in said housing so that said float and said lift linkage is carried upward through said bore and out of said housing in response to a rise in liquid level through said housing.

4,114,642
WATER CLOSET VALVE ASSEMBLY

Robert Ralph Robbins, 62 Thatcher Dr., Winnipeg, Manitoba, Canada

Continuation-in-part of Ser. No. 561,839, Mar. 25, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,812
Int. Cl.[2] F16K *31/24*
U.S. Cl. 137—436 **26 Claims**



1. In a water closet tank which includes a float, connecting means extending from said float, an overflow tube in said tank and a water supply connection through the wall of said tank; the improvement comprising a float operated valve assembly in said tank, said valve assembly including a body, a valve seat in said body, means operatively connecting said water supply connection to said valve seat, outlet means in said body operatively connected with the interior of said tank, a valve action having an open position and a closed position, situated within said body and controlling the flow of water past said valve seat and into said tank, said valve action including a flexible disphragm mounted in said body and spanning said valve seat and engaging said valve seat when said valve action is in the closed

position, means operatively connected to said connecting means to permit opening of and to close said valve action relative to said valve seat, said last mentioned means including mechanical means for moving said diaphragm and holding same onto said valve seat when said valve action is in the closed position and means to control the pressure of water on both sides of said diaphragm when said diaphragm is moved away from said valve seat thereby reducing the effective hydraulic pressure holding said diaphragm away from said seat and reducing the mechanical pressure from said mechanical means, required to move said diaphragm towards said valve seat, said last mentioned means including first means communicating between the space bounded by said diaphragm on the side thereof facing said valve seat and said outlet means, second means communicating between said space and the space on the opposite side of said diaphragm and said first and second means being positioned on the downstream side of the valve seat and both communicating with the outlet means.

4,114,643

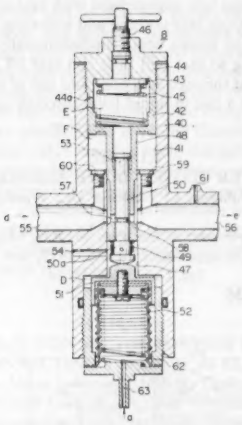
VALVE OPERATING MECHANISM OF INTERNAL COMBUSTION ENGINE

Syuniti Aoyama; Yoshimasa Hayashi, both of Yokohama, and Yasuo Nakajima, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Division of Ser. No. 702,073, Jul. 2, 1976. This application Apr. 27, 1977, Ser. No. 791,243

Int. Cl.[2] F16K *21/14*

U.S. Cl. 137—495 **5 Claims**



1. A pressure regulator for regulating the pressure of a fluid to a predetermined level in response to a control pressure, comprising:

a body having a fluid inlet, a fluid outlet, a first operating chamber which is supplied with the fluid pressure of said fluid outlet, a second operating chamber which is supplied with the control pressure, and a passage means for communicable between said fluid inlet and said fluid outlet;

a first responding means for being operated in response to the fluid pressure within the first operating chamber;

a first control member which is movably disposed at said passage means and arranged to move with said first responding means;

a second responding means for being operated in response to the fluid pressure within said second operating chamber;

a second control member which cooperates with said first control member to form a variable orifice in said passage means, said second control member being arranged to move with said second responding means.

4,114,644

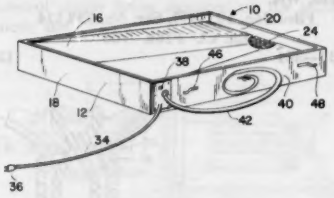
RECYCLING DRAIN PAN

Eldon L. Piper, 1525 West La., Billings, Mont. 59101

Filed Feb. 8, 1977, Ser. No. 766,720

Int. Cl.[2] F04F *11/00*

U.S. Cl. 137—565 **6 Claims**



1. A self-contained recycling drain unit comprising: a hollow enclosure having relatively narrow top, bottom and side walls, and a front wall extending between said walls which slopes downwardly from said bottom wall towards said top wall, a drain opening in said front wall adjacent said top wall, pump means forming an integral part of said unit having an outlet adjacent said bottom wall, and a flexible hose having one end connected to the outlet of said pump means and a free end for recycling fluid accumulated within said enclosure.

4,114,645

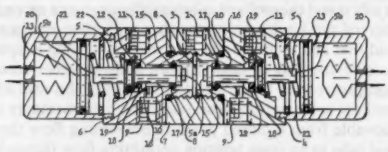
DIRECTIONAL VALVES WITH THERMO-ELECTRIC OPERATORS

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Aug. 27, 1976, Ser. No. 718,343

Int. Cl.[2] F15B *13/044*

U.S. Cl. 137—596.17 **5 Claims**



1. A directional poppet valve comprising:

a valve housing having a first and a second ends interconnected by an axially extending bore passing therethrough, said bore including valve seats therein and a plurality of perpendicular fluid ports communicating therewith, said bore further including a slidably received and axially movable stem held therein by detachable poppet members which also act as cushions during the position change of said stem in valve operation controlling the directional flow therethrough, including fluid communication between said fluid ports when said stem is shifted between a first and a second positions quietly, means for shifting said stem inside said housing bore within positions controlled by said cushioning poppet members acting as valve seals inside said valve seats, in cooperation with fluid pressure force exerting an end thrust over stem surfaces exposed thereto, and for maintaining said stem in at least one of said positions by said end thrust fluid pressure induced thereupon, said means for shifting said stem including an electrically energized thermal operator capable of exerting a push force in a direction opposite the direction said fluid pressure induced said end thrust thereupon until said position change occurs, and subsequently for maintaining said position until said electrically energized operator is de-energized to result in automatic position change of said stem and return to the original position which maintains

fluid supply means normally closed for as long as said electrically energized operator is de-energized due to said end thrust constantly prevailing over said surfaces of said stem, energization of said operator electrically allowing new supply of fluid through said valve when said push force urges said stem to be shifted therein, said thermal operator disposed coaxially with said stem including an electric heating element inside a chamber of said operator to create instant pressure increase of a refrigerant housed therein exerting high vapor pressure over a slidingly movable coaxial operator-end-closure abutting said stem during the shifting thereof while when said thermo-electric operator is deenergized electrically, said operator end thrust force disappears allowing said fluid pressure force to dominate over said stem surfaces exposed thereto urging said return of said stem to the original position automatically by said fluid pressure force prevailing therein, said slidingly movable coaxial operator-end-closure maintained a distance away from said stem end by a compression spring when said operator is de-energized, said spring acting as a biasing force means for said vapor pressure force refrigerant exerts therein.

4,114,646

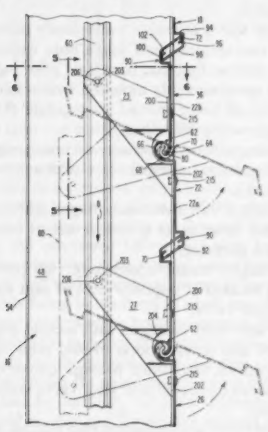
ROTATING BLADE FIRE DAMPER

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173. This application Feb. 2, 1977, Ser. No. 764,774

Int. Cl.[2] F24F *13/14*; F16K *1/22*

U.S. Cl. 137—601 **3 Claims**



1. In a fire and air control damper having a frame, a plurality of blades and rotation means for allowing selective rotational displacement of said blades with respect to said frame between open and closed positions, the improvement wherein said frame comprises an inwardly depending flange disposed within a plane which is parallel to the plane of said blades in the closed position and wherein first and second substantially parallel blade sections sealingly engage first and second opposing sides of said inwardly depending flange when said blades are in the closed position, the longitudinal edges of adjacent blades being configured to form opposing hook-shaped portions, said hook-shaped portions each comprising a transverse portion extending generally away from the plane of said blade and a tip portion spaced apart from said transverse portion to form the leading edge of said blade upon the rotation of said blade, said tip portion of each hook-shaped portion being configured to engage an interior surface of the hook-shaped portion of each adjacent blade in the closed position and to cooperate with a surface of the transverse portion to slidingly engage said surface through a predetermined arc of blade rotation as the blades are moved from the closed towards the open position, whereby a double seal is maintained in the closed position and through said predetermined arc of blade rotation.

4,114,647

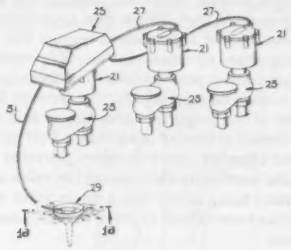
FLUID CONTROL SYSTEM AND CONTROLLER AND MOISTURE SENSOR THEREFOR

Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Clifton J. Burwell, Northridge, Calif., a part interest

Filed Mar. 1, 1976, Ser. No. 662,682

Int. Cl.[2] A01G *25/16*

U.S. Cl. 137—624.2 **15 Claims**



1. A sprinkler system comprising:

a plurality of valves, each of said valves having means responsive to electrical drive control pulses to open and close the valves;

a controller having first and second controls, said controller being a means for repetitively providing a train of drive control pulses on a plurality of controller terminals, at intervals determined by said first control in accordance with a desired watering frequency, said drive control pulses in each pulse train being separated in time as determined by said second control in accordance with a desired watering time; and

means for coupling said controller terminals to said plurality of valves.

4,114,648

DOUBLE ACTING ELECTROMAGNETIC VALVE

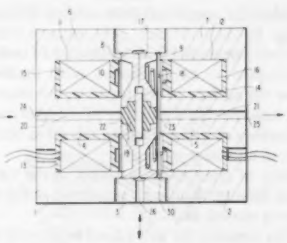
Hiroyuki Nakajima, Ashiya, and Takashi Hosokawa, Osaka, both of Japan, assignors to Konan Electric Co., Ltd., Nishinomiya, Japan

Filed Dec. 29, 1975, Ser. No. 645,135

Claims priority, application Japan, Dec. 25, 1974, 48-2573

Int. Cl.[2] F16K *11/00*

U.S. Cl. 137—625.5 **3 Claims**



1. A double acting electromagnetic valve comprising a hollow main body having internally a space acting as a valve chamber, a pair of magnetic cores each having a concentric polar arrangement and an E-shaped axial cross section, secured respectively to two lateral surfaces of said main body such that

the end of the central leg of each magnetic core and at least one part of the annular end surface of the outer leg of each said core are disposed directly within said valve chamber, a movable magnetic member positioned in said valve chamber so as to be shiftable axially therein between said pair of cores to bring the magnetic member into tight contact with said end of the central leg and said one part of the annular end surface of the outer leg of either one of said magnetic cores when the member is moved to an extremity of said chamber, two coils each encased in a coil-receiving recess formed between the central leg and the outer leg of the magnetic cores, respectively, said coils being adapted to be energized to magnetize the respective magnetic core to bring said magnetic member into said tight contact positions, respectively, said magnetic cores being made of high carbon steel constituting a magnetic material which is not a permanent magnet but has sufficient residual magnetism to retain said movable member in its respective tight contact position following deenergization of said respective coils, a fluid passage formed through the central leg of each one of the magnetic cores and in said main body, a valve seat formed at the end of each core fluid passage exposed to said valve chamber, valve members provided on said shiftable magnetic member to abut against the valve seats, and said valve members being united into a single valve member made of a rubberlike material and exposed to both sides of said magnetic member.

4,114,649

LEAD DOSING VALVE

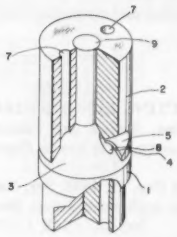
Hans-Georg Lindenberg, Hannover-Stöcken; Joachim Illmann, Stelingen, and Hans-Joachim Golz, Hannover, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 25, 1976, Ser. No. 699,674

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530102

Int. Cl.[2] F16K *11/083*

U.S. Cl. 137—625.19 **9 Claims**



1. A valve for metering doses of liquid from a reservoir comprising

a valve body provided with a plurality of outlet ducts which are adapted to be positioned with their inlet openings below the surface of the liquid in the reservoir,

a valve head having a plurality of recesses corresponding to the number of outlet ducts in the valve body and adapted to close said inlet openings,

a plurality of open ended passages in the valve head, positioned for alignment with respective outlet ducts when the valve is closed, and

means for rotating the valve head relative to the valve body to alternately align the recesses in the valve head and the open-ended passages with the outlet ducts,

each recess being so dimensioned that, when it is aligned with the inlet opening, it frees a cross-sectional area which is smaller than the inlet opening, and

the liquid being molten lead for the production of storage battery parts.

4,114,650

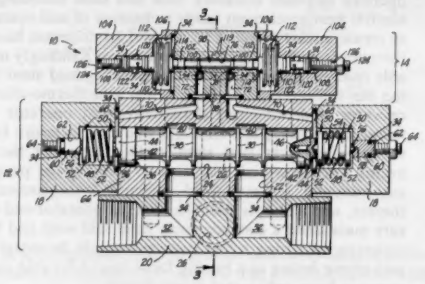
VALVE STRUCTURE

Carroll G. Gordon, 3 William Ct., Menlo Park, Calif. 94025

Filed Oct. 6, 1976, Ser. No. 730,225

Int. Cl.[2] F15B *13/042*

U.S. Cl. 137—625.63 **4 Claims**



1. A valve structure which comprises:

a principal valve and a pilot valve,

said principal valve having a valve body including a pressure port, a return port, two service ports and a bore located within said body, said ports intersecting said bore, said principal valve also having a valve spool movably mounted within said bore so as to be capable of being moved to regulate flow between said ports in said principal valve,

said pilot valve having a valve body including a pressure port, two service ports, and a bore within said body, said ports intersecting said bore, said pilot valve also having a valve spool movably mounted within said bore so as to be capable of being moved to regulate flow between said ports in said pilot valve,

a first passage for connecting said pressure ports of said pilot valve and said principal valve with a source of fluid under pressure,

said principal valve also including actuation means for moving said valve spool in said principal valve in response to applied pressure,

said actuation means comprising two pistons, said pistons being located at opposite ends of said valve spool in said principal valve,

second and third passages, said second passage connecting one of said service ports of said pilot valve with one of said pistons, said third passage connecting the other of said service ports of said pilot valve with the other of said pistons,

said pilot valve also including two pistons, said pistons being located at opposite ends of said valve spool in said pilot valve so as to be positioned adjacent to the extremities in said bore in said pilot valve,

control means for moving said valve spool in said pilot valve,

said control means including two cavities in said valve body of said pilot valve and two bellows,

said cavities being located at opposite extremities of said bore in said pilot valve,

each of said bellows being located within one of said cavities, each of said bellows having an immovable end mounted on said body of said pilot valve and having a movable end located adjacent to said valve spool in said pilot valve,

interfitting means connecting said bellows and said pilot valve spool for holding said movable ends on said bellows in alignment with said pilot valve spool,

said bellows being capable of exerting pressure against said valve spool in said pilot valve so as to move said valve spool in said pilot valve in accordance with the internal pressures within said bellows,

two separate port means in said valve body of said pilot valve for conveying fluid to the interiors of said bellows so as to move the free ends thereof.

4,114,651

COMBINED STOP AND CONTROL VALVE

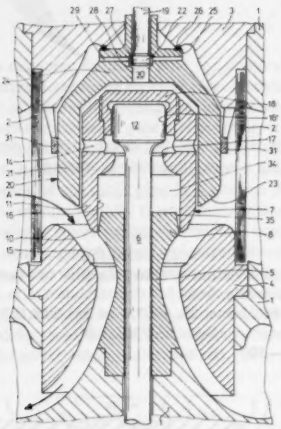
Arthur Oberle, Ennetbaden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 22, 1976, Ser. No. 679,463

Claims priority, application Switzerland, Apr. 30, 1975, 5563/75

Int. Cl.² F16K *1/00*

U.S. Cl. 137—630.14 **3 Claims**



1. A combined stop and control valve for mounting in a pipe carrying the working medium of a turbo machine, of which the stop valve body and control valve body are arranged independently of each other in a common valve housing and with the stop valve body being located upstream of the control valve body when viewed in the direction of flow of the working medium through the combined valve, said stop and control valve bodies being provided with coaxial valve seats located next to each other and immediately adjacent a flow opening, said stop valve body being in the form of a bell into the hollow cavity of which said control valve body is inserted, pilot valves provided respectively for said stop and control valve bodies, at least one axial guide for the movement of said stop valve body, and axially spaced guides for said control valve body one of which is established by its pilot valve for providing sliding engagement for said control valve body throughout its valving movement.

4,114,652

COMBINED STOP AND CONTROL VALVE

Arthur Oberle, Ennetbaden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

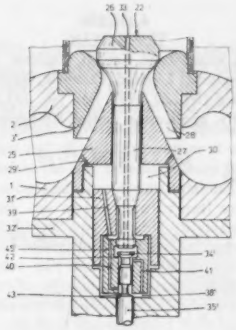
Filed Apr. 29, 1976, Ser. No. 681,728

Claims priority, application Switzerland, Apr. 30, 1975, 5565/75

Int. Cl.² F16K *1/00*

U.S. Cl. 137—630.14 **1 Claim**

1. A combined stop and control valve for the working medium in turbine installations and in particular for steam turbine installations, wherein the bodies of the stop and control valves are arranged co-axially to one another in a common housing and are independently controllable respectively by means of associated pilot valves for controlling flow of the working medium from a valve chamber out of the valve housing, wherein the body of said stop valve has a bell-shaped configuration terminating in a seating surface for closing off flow of the working medium through the valve, and a servo-piston component controlled by its pilot valve and actuated by the working medium, and wherein the body of said control valve has a bulb-shaped head provided with a seating surface for regulating flow of the working medium through the valve, and which is enterable into said bell-shaped stop valve body, said head being located at one end of a spindle slidable in a lead-through bushing, and the other end of said spindle terminating in a servo-piston operating in a cylinder, said spindle including a longitudinal bore therethrough for flow of the working medium from said valve chamber into one end of said servo-piston cylinder when the pilot valve for said contol valve is actuated, said bushing being provided with a passageway placing the other end of said servo-piston cylinder in communication with the outlet side of said valve, the improvement wherein said pilot valve correlated to operation of said control



valve body comprises a subsidiary spindle provided with two longitudinally displaced seating surfaces thereon cooperable with corresponding seating surfaces located on an assembly part mounted for movement together with said spindle of said control valve and servo-piston, said assembly part being provided with one bore extending from a location in said pilot valve adjacent one seating surface on said assembly part through a bore in said servo-piston to that end of said servo-piston cylinder which is connected by way of said passageway in said bushing with the outlet side of said valve, and said assembly part being provided also with a second bore extending from the opposite end of said servo-piston cylinder to a location in said pilot valve adjacent the other seating surface on said assembly part for connection with the bore in said control valve spindle.

4,114,653

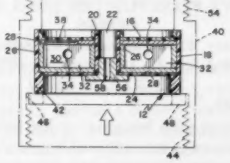
RUPTURABLE FLOW RETARDING DISK FOR FIRE HOSES

Jack M. Carlin, R.F.D. Box 135, Del Mar, Calif. 92014

Filed Sep. 13, 1976, Ser. No. 722,709

Int. Cl.² F15D *1/04*; F16K *17/40*

U.S. Cl. 138—45 **11 Claims**



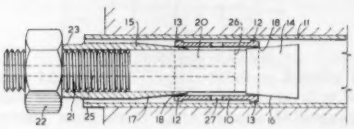
1. A delayed release device for installation in a liquid passageway temporarily restricting liquid flow therein comprising:

(a) a substantially impervious capsule having a casing which defines an enclosure;
(b) said capsule having at least one liquid-restraining wall and including support structure disposed in said enclosure to reinforce said restraining wall against collapse by external fluid pressure;
(c) said support structure being liquid-permeable and subject to rapid and drastic weakening when immersed in a liquid;
(d) at least a portion of the casing of said capsule being rupturable upon the occurence of a pre-determined level of external fluid pressure to admit liquid into said enclosure, whereupon said support structure is weakened and said restraining wall is subject to collapse to release liquid in said passageway.

4,114,654
TUBE PLUG

Arthur William Richardson, Kendal, England, assignor to Furmanite International Limited, Cumbria, England

Filed Oct. 20, 1976, Ser. No. 733,985
Claims priority, application United Kingdom, Feb. 19, 1976, 6692/76
Int. Cl.[2] F16L *55/18*
U.S. Cl. 138—89 **10 Claims**



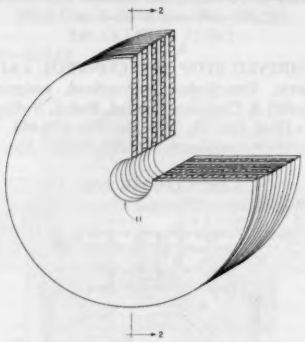
1. A bore plug comprising:
(i) a deformable sleeve to fit inside a bored structure, such as a tube, to be plugged
(ii) two tapered members interfitting with said sleeve to engage opposite ends thereof,
(iii) a structure carrying said tapered members and permitting relative movement of said members axially of the sleeve, said structure including parts relatively movable axially of the sleeve and each coacting with a respective one of the tapered members such that by relative movement of said parts said tapered members may be drawn together axially of the sleeve to deform permanently axially-spaced portions of the sleeve into circumferential engagement with the bore, an annular chamber being then bounded by the sleeve and the bore between said circumferentially-engaged portions, said sleeve having an aperture at a position axially between said circumferentially-engaged portions, and said structure including a passageway opening within said sleeve through said aperture and communicating with said chamber way for introduction to said chamber of a flowable sealant.

4,114,655
PROTECTIVE PLUG FOR THE ENDS OF TUBULAR CORES

Richard T. Bloker, 8224 Ammonett Dr., Richmond, Va. 23235

Filed Jun. 18, 1976, Ser. No. 697,619
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—89 **4 Claims**

1. A cylindrical plug bounded by flat leading and trailing faces and fabricated of interadhered layers of annular sheets of corrugated paperboard wherein the direction of the corrugations of each layer is aligned so as to cross at an angle of 30° to 90° with the direction of the corrugations of each contiguous layer, said plug being provided with an axial cylindrical hole the ratio of the diameter of said hole to the diameter of said plug being between 0.2 and 0.3, the layer which constitutes said leading face having a smaller diameter than the diameters

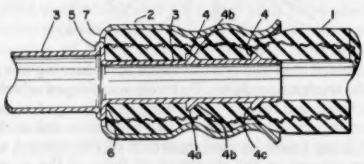


of subsequent layers, and the entire external surface of said plug containing a water-impervious coating.

4,114,656
HOSE ASSEMBLY

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Filed Jun. 20, 1977, Ser. No. 808,123
Int. Cl.[2] F16L *13/14*
U.S. Cl. 138—109 **1 Claim**



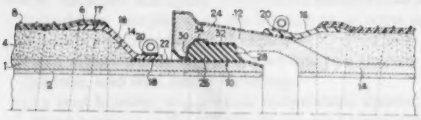
1. A hose assembly comprising a metallic tube or nipple having an annular radially outwardly extending bead spaced from one end of the nipple and providing a shoulder or stop disposed in a plane perpendicular to the axis of the tube or nipple, a non-metallic hose frictionally secured to said tube nipple and having an end in abutment with said shoulder or stop, whereby to pre-position said hose in predetermined axial relationship with said tube or nipple, and a metallic shell having a generally cylindrical body secured to said hose and having an inturned flange at one end engaging said end of said hose; and wherein said bead and said inturned flange are substantially co-planar; and wherein said tube or nipple is provided at axially spaced points with barbs extending outwardly from the outer surface of the tube or nipple and into the inner wall of said hose, and the body of said shell is provided at points spaced axially to correspond substantially with the spacing of said barbs with crimps extending into the outer wall of said hose, whereby said barbs and crimps are disposed in substantially the same diametric planes; and wherein said crimps are separated by circumferentially spaced webs; and wherein each barb has a surface which is concentric with the outer surface of the tube or nipple, a conical surface which extends from one end of said first-named surface to the outer surface of the tube or nipple and is disposed at that side of the rib which is remote from said stop or shoulder, and an annular flat surface which is substantially perpendicular to the axis of the tube and extends from the other end of said first-named surface to the outer surface of the tube.

4,114,657

LARGE-DIAMETER INSULATED PIPE

Michel Langenfeld, Vandoeuvre, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Sep. 27, 1977, Ser. No. 837,326
Claims priority, application France, Sep. 5, 1977, 77 26877
Int. Cl.[2] F16L *11/08*
U.S. Cl. 138—109 18 Claims



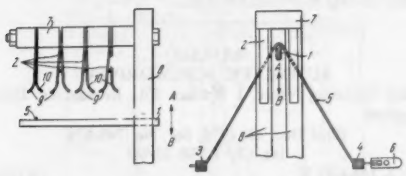
1. A large-diameter insulated pipe for conveying fluids at high temperature comprising an inner pipe, an outer protective layer, a foam of thermally insulating plastics material which is interposed between the inner pipe and outer layer and adheres to the inner pipe and to the outer layer and which covers a major part of the inner pipe but terminates at a distance from each of the ends of the inner pipe in a portion having an inclined surface of substantially frustoconical shape, said outer layer comprising a cover which is relatively rigid and terminates before reaching each frustoconical surface and a protective case for each of the frustoconical surfaces of the foam which case is at one end fixed to the cover and at the other end directly integral with the inner pipe, said case having sufficient elasticity to allow the foam to follow the expansion of the inner pipe while the cover remains immobilized.

4,114,658

MECHANISM FOR COMPENSATING THE LENGTH OF A WEFT THREAD FOR A LOOM

Vladimir Fomich Trubin, ulitsa Entuziastov, 5/1, kv. 28, and Alexei Alexandrovich Redin, ulitsa Egerskaya, 25, kv. 42, both of Cheboxary, U.S.S.R.

Filed Feb. 14, 1977, Ser. No. 768,493
Claims priority, application U.S.S.R., Mar. 1, 1976, 2329877
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—452 4 Claims



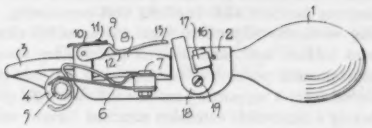
1. A mechanism for compensating the length of a weft thread for a stationary weft supply loom, comprising: a pair of thread guides fo guiding a weft thread which is about to be introduced into a shed, said thread guides defining between themselves a space along which a weft thread initially extends along a substantially straight line; a movable means movable across said straight line through and beyond said space for engaging a weft thread guided by said thread guides and extending the weft thread from said guides while displacing the weft thread along a predetermined path and forming a loop from the weft thread; and a releasable gripping means situated along said path for receiving said loop and for releasably retaining the formed loop of the weft thread, said releasable gripping means including at least one stationary plate-type grip of a converging configuration at an end provided for entrance of the loop of weft thread.

4,114,659

PIPETTE FILLING AND LIQUID DISPENSING DEVICE

Moshe Goldberg, Tel Aviv, Israel, and Eitan Goldberg, 9 Akiva Eger St., Tel Aviv, Israel, assignors to Eitan Goldberg, Tel Aviv, Israel

Continuation of Ser. No. 652,094, Jan. 26, 1976, abandoned. This application Jun. 7, 1977, Ser. No. 804,278
Claims priority, application Israel, Jun. 18, 1975, 47510
Int. Cl.[2] B65B *3/10*
U.S. Cl. 141—26 5 Claims



1. A pipette filling and liquid dispensing device which comprises in combination: a conduit including a first section and a second section each having a first end and a second end, said second section having means at said first end thereof for attachment to a pipette; a resiliently compressible bulb connected to said first end of said first section of said conduit; an aperture provided in the said conduit; means for alternatingly closing and opening said aperture to establish connection of said conduit with the atmosphere or seal said conduit off against the atmosphere; a removable valve unit inserted between said second ends of said first and second sections of said conduit, said valve unit including a resilient tubular member having its two ends releasably connected respectively to said second ends and a valve body within said member, said valve unit being easily released and removed from said conduit; and

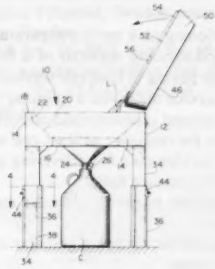
a presser member separate from said valve unit and which is movable into contact with said resilient tubular member to, said presser member including means for distorting said resilient tubular member to effect an opening of said valve unit and further including means for holding said valve unit in place.

4,114,660

AUTOMOBILE OIL CHANGING DEVICE

Michael Arruda, 144 Pleasant St., Rehoboth, Mass. 02769

Filed Apr. 18, 1977, Ser. No. 788,604
Int. Cl.[2] B65B *39/00*; B67C *11/04*
U.S. Cl. 141—98 6 Claims



1. A device for the convenient collection and disposal of liquids such as automobile waste oil comprising a generally rectangular receptacle having a bottom wall and peripheral side walls, a downwardly inwardly extending funnel-shaped central wall for receipt of liquid thereon, said central wall having an open top and projecting through said bottom wall and terminating in a downwardly extending conduit for directing said liquid from said central wall outwardly of said receptacle as to containers adapted for placement therebeneath, said side walls, said bottom wall and said central wall cooperatively

forming a hollow enclosed storage chamber surrounding said central wall and disposed within said receptacle, means opening through one of said side walls providing access to said chamber, said conduit including valve means for controlling the flow of said liquid through said conduit, said receptacle further including a detachable cover positioned over and adapted to close said open top, said cover contacting upper portions of said central wall in liquid sealing relationship thereto so that liquid may be temporarily transported in said receptacle and means for positioning said receptacle for receipt of containers beneath said conduit, said positioning means including vertically adjustable legs downwardly extending from said bottom wall, said conduit terminating above the uppermost possible position of said legs such that said conduit is displaced from a supporting surface for said legs, said legs each having a removable extension attached thereto, said legs and extensions slidably nested and means for maintaining the relative positioning of said legs and said extensions.

4,114,661

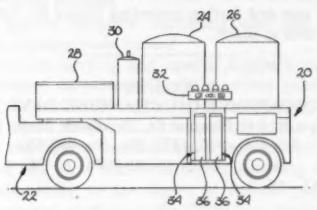
MOBILE FLUID TREATMENT TANK SERVICING APPARATUS

James A. Harris, 11608 Modoc, Ventura, Calif. 93003

Continuation of Ser. No. 570,830, Apr. 23, 1975, abandoned, and a continuation-in-part of Ser. No. 382,672, Jul. 26, 1973, Pat. No. 3,880,212. This application Dec. 10, 1976, Ser. No. 749,328

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—231 **33 Claims**



1. Water conditioning tank service apparatus for removing a granular water conditioning material of a first characteristic from a service tank having at least one service tank connection and refilling the service tank with a granular water conditioning material of a second characteristic comprising:

engaging means for engaging at least one service tank connection on a service tank for delivering granular material to and from the service tank;

first tank means for retaining granular material of a first characteristic;

second tank means for retaining granular material of a second characteristic;

first flow means coupled between said first tank means and said engaging means for delivering said granular material from said engaging means to said first tank means;

drive means for encouraging flow in said first flow means of sufficient velocity to remove substantially all of the granular material from a service tank; and

second flow means coupled between said second tank means and said engaging means for delivering sid granular material from said second tank means to said engaging means to fill the service tank with granular material from said second tank means.

4,114,662

ARTICULATED ARMS

John Purefoy Goodacre, Woodford; Colin Potter, Stockport, and Peter Ball, Sheffield, all of England, assignors to National Supply Company (U.K.) Limited, Stockport, England

Filed Dec. 14, 1976, Ser. No. 750,314

Claims priority, application United Kingdom, Dec. 18, 1975, 51992/75

Int. Cl.[2] B65G *67/00*

U.S. Cl. 141—387 **9 Claims**

1. In an articulated arm for connecting a fixed product conduit to a marine tanker, the improvement comprising:

a. a product tube including an inboard limb pivotally connected to said fixed product conduit so as to be pivotal relative thereto about fixed axes of said product conduit and an outboard limb pivotally connected to said inboard limb,

b. a product tube support frame, a bearing assembly pivotally mounting said support frame for pivotal movement about substantially the same axes as said inboard limb,

c. support means connecting the outboard end of said product tube support frame to said outboard limb of said product tube, said support means allowing relative movement between said outboard end of said product tube support frame and said outboard limb of said product tube, and

d. a counterweight mounted on said product tube support frame, said counterweight balancing the weight of said product tube support frame and said product tube during the pivotal movement thereof.

4,114,663

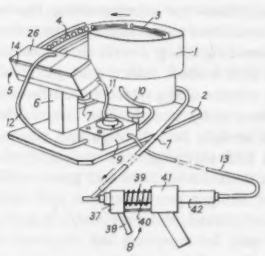
AUTOMATIC SCREWDRIVER

Brynley Emberley Viner, 1 Wallace Rd., Broadstone, Dorset, England

Filed Dec. 13, 1976, Ser. No. 749,673

Int. Cl.[2] B25B *23/00*

U.S. Cl. 144—32 R **6 Claims**



1. An automatic screw-driving and feeding apparatus comprising:

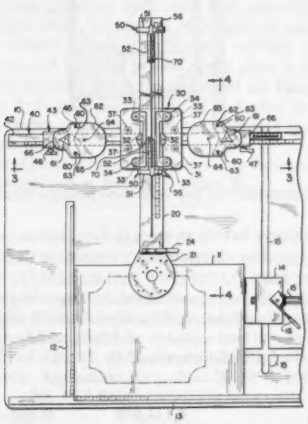
(i) a screwdriver body including a tubular housing axially movable with respect to the remainder of the body;
(ii) a plurality of screw holding elements mounted in said tubular housing;
(iii) means for resiliently biasing said screw holding elements inwardly such that they may hold a screw in axially disengageable manner;
(iv) drive means in the screwdriver body adapted, upon axial inwards movement of the tubular housing, the engage with the screw and apply rotary drive thereto;
(v) a feed tube merging with the housing at an acute angle rearwardly of the holding elements;
(vi) feed means which supply screws one at a time to said feed tube, said feed means including:
(a) a feed housing, and a block reciprocable therein, the block having a recess of a size to receive a screw therein and reciprocable between a first position in which the recess can receive a screw from screw supply means, and a second position in which the screw can pass from the recess into the feed tube, and the feed housing having a portion of its side wall cut away so that screws supplied along a track and hanging by their heads therefrom can pass through the cut away in the wall of the housing and enter said recess one at a time when the slide block is in said first position;
(b) support means extending into said recess, such support means being removed from the recess when the slide block moves into its second position, the support means supporting the tip of the screw in a desired position when the block is in its first position but not obstructing exit of the head of the screw axially from the recess when the block moves to its second position.

4,114,664

APPARATUS FOR ROUTING DESIGNS IN PANELS

Lawrence M. Cotton, New Bern, N.C., assignor to The Stanley Works, New Britain, Conn.

Filed Nov. 24, 1976, Ser. No. 744,528
Int. Cl.[2] B27C *5/10, 5/00*
U.S. Cl. 144—134 D **19 Claims**



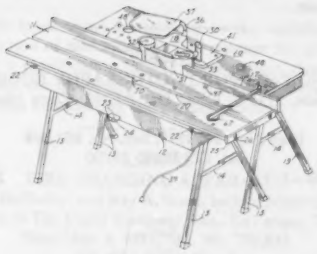
1. An apparatus for use with a router for routing designs in panels comprising:
a. means providing a work surface;
b. means to secure a panel in predetermined position on the work surface;
c. a rail extending parallel to one edge of a panel secured in said predetermined position;
d. a carriage mounted on the rail for sliding movement longitudinally of the rail;
e. a bar mounted on the carriage for longitudinal reciprocating movement thereon at right angles to the rail
i. said bar having an outer end adapted to extend over the panel to be routed;
f. means on said outer end of the bar for mounting a router;
g. adjustable stop means for determining the limits of movement of the carriage and the bar.

4,114,665

WOODWORKING BENCH FOR PORTABLE MOTOR DRIVEN HAND TOOLS

Henry P. Decker, 2233 S. Alton Way, Denver, Colo. 80231

Filed May 6, 1976, Ser. No. 683,911
Int. Cl.[2] B25H *1/02*
U.S. Cl. 144—286 R **13 Claims**



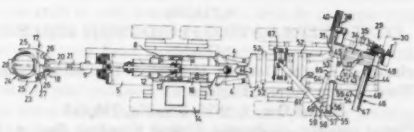
1. A woodworking bench for utilizing a portable motor driven belt sander for the precision finishing of wooden workpieces, said bench comprising a top wall having a flat top surface and an upright wall rigidly attached to said top wall, said upright wall comprising two portions having an opening therebetween and having parallel flat front surfaces normal to said top surface, means providing a seat for receiving a portable sander of the type having a flat working face and for holding the working face in a position parallel to and in alignment with the face of one of said sections of said upright wall, and in advance of the face of the other of said sections, and means for securely holding the sander to said bench in said position of alignment.

4,114,666

METHOD OF FOREST HARVESTING AND A MACHINE FOR PERFORMING SAID METHOD

Lars Öjvind Bruun, Filipstad, Sweden, assignor to Volvo BM AB, Eskilstuna, Sweden

Filed Jun. 14, 1976, Ser. No. 695,570
Claims priority, application Sweden, Jun. 27, 1975, 7507407
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC **9 Claims**



1. A method for felling standing trees and cutting portions from the felled trees, utilizing a vehicle having a front end and a rear end and an extendable and retractable boom which has means for gripping, cutting and lowering standing trees, the vehicle further having a delimbing device at the rear end thereof, the boom being rotatable independently of the delimbing device around a substantially vertical axis at the vehicle front end, the method comprising driving the vehicle forward up to a stand of trees, extending the boom substantially over

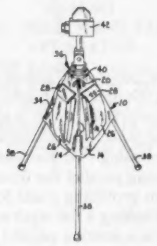
the front end of the vehicle toward a tree, gripping the tree with the boom, cutting the tree, then retracting the boom and swinging the boom around its substantially vertical axis, with the severed tree stem held substantially vertically, to a position where the boom is pointing substantially over the rear end of the vehicle, then lowering the tree substantially in the longitudinal direction of the boom with the tree top directed backward away from the vehicle, introducing the root end of the tree into the delimbing device, and delimbing the tree while advancing the tree from the rear end of the vehicle toward the front end thereof, and during a first phase in which the delimbing device assumes a first position at an angle to the longitudinal axis of the rear vehicle section, feeding delimibed logs out in cut or whole lengths over one side of the vehicle, then swinging the device so that its delivery end is directed to a hopper located between the delimbing device and the vehicle front end, and then feeding cut logs to the hopper during a second phase.

4,114,667

CARRYING PACK FOR PHOTOGRAPHY EQUIPMENT

Alfred Belson, 1111 S. Coast Dr., #E102, Costa Mesa, Calif. 92626

Filed Nov. 14, 1977, Ser. No. 851,369
Int. Cl.[2] B65D *29/00*
U.S. Cl. 150—1 **20 Claims**



1. A device adapted for use to carry a tripod having a head and legs extending therefrom which are movable between a spread position and a collapsed position, said device comprising:

a neck portion presenting an opening adapted to receive the head of the tripod therethrough;

intercoupled sides extending downwardly from said neck portion, said sides being adapted to extend along each of the tripod legs;

means for securing said sides to each of the tripod legs with said legs in the spread position; and

means on one of said sides adapted for use to carry the tripod.

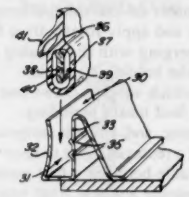
4,114,668

CONTAINERS HAVING FLUID-TIGHT SEALING MEANS

Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England

Filed Dec. 1, 1976, Ser. No. 746,614
Claims priority, application United Kingdom, Dec. 4, 1975, 49890/75; Jun. 2, 1976, 22758/76
Int. Cl.[2] B65D *51/16*
U.S. Cl. 150—0.5 **5 Claims**

1. A container comprising a flexible sheet of impermeable material having a flexible inflatable tube around its periphery and a rigid or semi-rigid impermeable base member having an endless slot or groove to receive said tube, the slot or groove being shaped to hold the tube when the latter is inflated, whereby the tube may be retained in the slot or groove after insertion therein by inflation of the tube wherein the tube is provided with resilient means inside the tube and extending along the whole length of the tube and deformable to permit the tube being passed into the slot or groove, said resilient means urging the walls of the tube apart to engage the side walls of the slot or groove, the resilient means being of sponge material secured to the inside surface of the tube over a limited part of the cross-sectional periphery of the tube to leave a



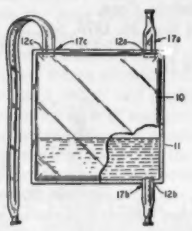
region between the resilient means and the inside surface of the tube forming a duct extending continuously along the length of the tube for inflation of the tube, whereby the tube, when uninflated, has to be deformed to force it into or out of the slot or groove, so ensuring a seal between the base and the cover, said container furthermore having valve means to permit the interior of the container to be pressurized or evacuated of air.

4,114,669

STERILE PORT STRUCTURE

Marilyn Bishop, One N. 341 Indian Knoll Rd., West Chicago, Ill. 60185

Division of Ser. No. 479,755, Jun. 17, 1974, Pat. No. 3,968,195. This application Feb. 9, 1976, Ser. No. 656,470
Int. Cl.[2] F16L *55/10*
U.S. Cl. 150—8 **5 Claims**



1. A port structure for use with fluid passage means comprising:

a flexible sleeve having an inner surface, and an outer surface having greater thermoplastic properties than said inner surface; and

a rigid tube secured to said sleeve having a free end extending beyond said sleeve, whereby said outer surface of said sleeve can be heat sealed to said fluid passage means without sealing off said inner surface.

4,114,670

METHOD FOR SECURING SCREW MEANS ONTO METAL PLATE AND METAL PLATE HAVING SCREW MEANS SECURED

Tetsuya Akashi, and Akio Nikawa, both of Hatano, Japan, assignors to Topura Co., Ltd. (Kabushiki Kaisha Tohpura), Japan

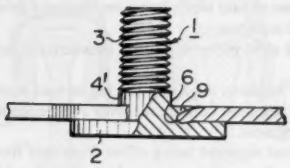
Filed Jul. 19, 1976, Ser. No. 706,430
Claims priority, application Japan, Apr. 7, 1976, 51/37275
Int. Cl.[2] F16B *39/28;* B21D *39/00;* B23P *11/02*
U.S. Cl. 151—41.72 **15 Claims**

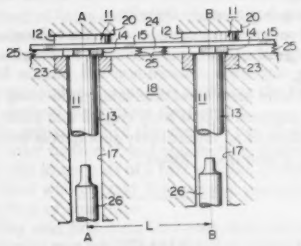
1. A method for fastening a screw having a polygonally

shaped stepped neck formed between a shaped screw head having a bearing surface and an elongated screw body to a metal plate having a polygonally shaped opening corresponding to said polygonally shaped stepped neck comprising the steps of

inserting said stepped neck into said opening so that said bearing surface is disposed in flush contact with said metal plate;

inserting said elongated screw body in a receiving means having an elongated hole bored therein, said elongated hole having an outer diameter radially dimensioned slightly larger than the outer diameter of said elongated screw body; and





applying a force to said receiving means to thereby affect an upsetting operation by applying force to said stepped neck to press said stepped neck and said receiving means against each other, so that the outer wall of said stepped neck is radially enlarged to form a radially extending flange and said opening in said metal plate is deformed plastically whereby the outer surface of the flange is substantially flush with the surface of said plate to thereby securely clamp said metal plate between said flanges and said screw head.

10. A metal plate having at least one screw fastened thereto formed by the method as defined in claim 35.

4,114,671

PNEUMATIC TIRE FOR VEHICLES HAVING IMPROVED HANDLING AND ROAD GRIPPING

Luigi Maiocchi, Vernate-Frazione Moncucco (Milan), and Luigi Silva, Muggio (Milan), both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

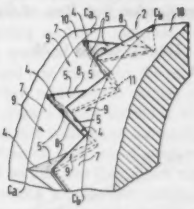
Filed Jan. 11, 1977, Ser. No. 758,487

Claims priority, application Italy, Jan. 26, 1976, 19567 A/76

Int. Cl.[2] B60C *11/06, 11/12*

U.S. Cl. 152—209 R **6 Claims**

1. A tire for vehicle wheels having a tread provided with at least one groove of zig-zag configuration with respect to the circumferential direction of the tire, each groove occupying a portion of tread defined by a pair of parallel planes perpendicular to the axis of said tire, wherein contiguous pairs of groove lengths alternatively meet at an apex causing said tread portion to appear to be divided into blocks, each block being defined by said contiguous pairs of groove lengths and by that portion of the tread surface between said parallel planes facing said apex and wherein the radially external surface of said blocks is inclined towards the axis of said tire and proceeds in the axial direction from the plane wherein a block is terminated towards the facing plane to form in a new tire a tread pattern, whose tread portion constitutes the contact area of said tire, comprising a circumferential rectilinear groove having the same width as the distance between said parallel planes and which will



cause, with tread usage, an increase in the radially external surface portion of said blocks which contact the ground and will cause a modification in said tread pattern that progressively annuls the circumferential rectilinear grooves while at the same time emphasizing the zig-zag grooves.

4,114,672

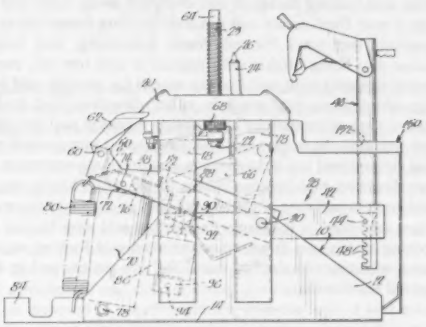
TIRE CHANGING APPARATUS

Jimmie L. Holladay, and Ray A. Scott, both of Nashville, Tenn., assignors to The Coats Company, Inc., LaVergne, Tenn.

Filed May 9, 1977, Ser. No. 795,015

Int. Cl.[2] B60C *25/12*

U.S. Cl. 157—1.24 **7 Claims**



1. In a tire changing apparatus, the combination of:

a base;

an upwardly extending frame structure mounted on said base;

a tire receiving table mounted on said frame structure;

an elongated rocker arm pivoted at a pivot point intermediate its ends to said frame structure with its opposite ends extending to opposite sides of said table;

upper and lower bead loosener assemblies associated with respective ends of said arm;

a rotatable post mounted on said table top;

means interconnecting said arm and said post for rotating said post in response to pivotal movement of said arm;

a first cylinder connected between said arm and said apparatus in substantial alignment with one of said bead loosener assemblies for effectively directly operating said one bead loosener assembly and concurrently pivoting said arm in at least one direction; and

a second cylinder connected to said arm at a location spaced from the point of connection of said first cylinder to said arm and to said apparatus for pivoting said arm in at least said one direction in concert with said first cylinder and with a force applied to said one bead loosener assembly less than the force developed by said second cylinder.

4,114,673

LOCKING MECHANISM FOR VERTICAL SLAT BLIND

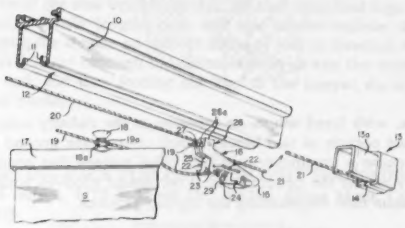
Hendrik de Wit, Rotterdam, and Kurt Heinz Frentzel, Zevenhoven, both of Netherlands, assignors to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Mar. 29, 1977, Ser. No. 782,316

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613750

Int. Cl.[2] E06B *9/26*

U.S. Cl. 160—166 A 8 Claims



1. In a slatted blind having a plurality of vertical slats, a top rail, opposed guide flanges on said top rail defining a track groove and slat supports supported by said guide flanges in said track groove for supporting said vertical slats, the improvement comprising a locking means, means connecting said slats to each other, said connecting means also connecting the locking means to the last slat of said blind, a hook extending from said locking means in one direction away from said last slat, a stop fixed to the top rail, said locking means being engaged in said track for movement therealong, said locking means also being tiltable with respect to said top rail, tension means engaged with said locking means for moving said locking means along said track in either direction, said locking means upon movement by said tension means in said one direction bringing the hook of said locking means into contact with said stop on said top rail and upon continued movement in said one direction said locking means tilting to lockingly engage said hook in said stop of the top rail, and said connecting means when said hook is lockingly engaged in said stop biasing said locking means in a direction to maintain said locking engagement whereby the slats of said blind are maintained in their spaced relationship.

4,114,674

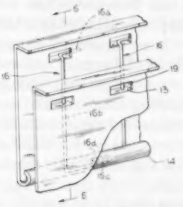
EXPANDABLE DOOR

Frank F. Gabry, 9841 N. Elms Ter., Des Plaines, Ill. 60016

Continuation-in-part of Ser. No. 689,537, May 24, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,592

Int. Cl.[2] E06B *9/00, 3/12*

U.S. Cl. 160—222 4 Claims



1. A vertically expandable door closure, comprising:

a plurality of door sections,

means to suspend said sections one from the other when said door closure is in a closed position,

each said section having a base and at least one leg depending therefrom;

said suspension means including a channel formed on each said section,

said channel extending along the lowermost edge of each said leg;

said suspension means further including at least one guide hook formed on each said section,

each said guide hook extending from one said leg intermediate said channel and said base,

each said guide hook shaped, sized, and positioned to engage the channel of an immediately suprajacent section,

each said guide hook having a guide aperture formed therethrough;

a plurality of flexible wire struts,

at least one of said struts being respectively mounted to each of said sections,

each said strut including a first substantially horizontal segment,

said first segment engaging the leg of said section,

a second segment continuous with and depending from said first segment,

said second segment being offset from said first segment,

said second segment passing through one said guide hook aperture on an immediately subjacent section,

a third segment continuous with said second segment and extending horizontally therefrom,

said third segment engaging said channel along said lowermost edge of said section when said first segment engages said leg,

each said wire strut directing said guide hook along said second segment to positively engage said guide hook with the channel of an immediately suprajacent section during closing of said door closure.

4,114,675

METHOD AND APPARATUS FOR POURING A MOLD WITH A SELECTABLE AMOUNT OF CASTING MATERIAL

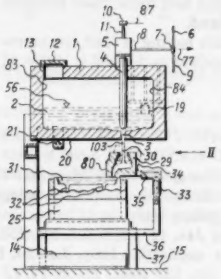
Erwin Buhrer, Vogelingasschen 40, Schaffhausen, Switzerland

Filed Mar. 11, 1977, Ser. No. 776,912

Claims priority, application Switzerland, Mar. 15, 1976, 3169/76

Int. Cl.[2] B22C *19/04*

U.S. Cl. 164—4 13 Claims

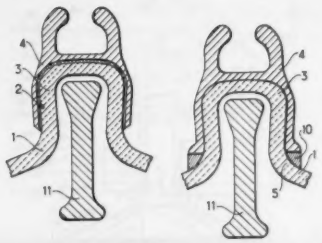


1. A method for pouring a mold with liquid metal to form a casting comprising the steps of locating over said mold a liquid metal receptacle having pouring means at the bottom thereof through which said liquid metal may be poured into said mold, continuously sensing the pressure head of said liquid metal in said receptacle during pouring of said mold, numerically integrating into a constant value the product of the multiplication of a function of the pressure head and time, and controlling the pouring means to terminate pouring of said mold when said value reaches a predetermined set value.

4,114,676
METHOD FOR FIXING A METALLIC ARMATURE ON A NON-METALLIC PART

Michel Willem, Cusset, France, assignor to Ceraver S.A., Paris, France

Continuation-in-part of Ser. No. 423,825, Dec. 11, 1973, Pat. No. 3,964,536. This application Mar. 9, 1976, Ser. No. 665,219
Claims priority, application France, Dec. 12, 1972, 72 44170
Int. Cl.² B22D *19/12*
U.S. Cl. 164—108 1 Claim



1. A method of fixing a metallic connecting cap of an electrical insulator of the rod-and-cap type on a non-metallic dielectric part, said metallic connecting cap comprising a lower part to be fitted around the non-metallic dielectric part and an upper part containing a cavity for receiving the lower part of a rod, said method comprising the steps of:

(1) closely applying a first thin metallic part to at least a part of the outer surface of said non-metallic dielectric part on which said lower part of a first metallic connecting cap is to be fixed wherein said first metallic part provides good conduction of heat; then

(2) molding said first metallic connecting cap on said first thin metallic part while the material of which said metallic connecting cap is to be composed is in the melted state, whereby said first metallic part reduces thermal shock to said non-metallic dielectric part by maintaining a moderate temperature gradient across said non-metallic dielectric part; while simultaneously

(3) molding a second thin metallic part in the form of a ring; then

(4) separating said second thin metallic part from said first metallic connecting cap; and then

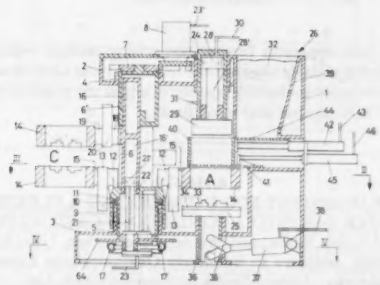
(5) closely applying said second thin metallic part to at least a part of the outer surface of a second non-metallic dielectric part on which a lower part of a second metallic connecting gap is to be fixed.

4,114,677
MOLDING MACHINE FOR PRODUCING CASTING MOLDS

Max Wernli, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Sep. 29, 1976, Ser. No. 727,939
Claims priority, application Switzerland, Oct. 3, 1975, 12825/75
Int. Cl.² B22C *11/04, 11/10*
U.S. Cl. 164—168 9 Claims

1. Molding machine for producing casting molds and having several stations angularly spaced apart from one another and including a first station, a compressing unit located at said first station, a pattern carrier for replaceable pattern plates aligned with said compressing unit in said first station, said compressing unit including a compressing member movable toward said pattern carrier for compressing molding material located therebetween, and a device for feeding molding material located at said first station laterally from said compressing unit for supplying the molding material to a position between said compressing member and said pattern carrier, a swivel unit having a plurality of swivel arms connected thereto, a first box frame attached to one said swivel arm and a second box frame attached to another said swivel arm, each said first and second box frame arranged to form one-half of a casting mold, said swivel unit having an axis and being rotatable about the axis for moving said swivel arms into successive stations so that said first and second box frames can, in turn be positioned in said first station between said compressing unit and said pattern carrier for receiving molding material from said device for feeding molding material and then compressing the molding material within said box frames by the movement of said compressing unit toward said pattern carrier, at least one said first and second box frames being rotatable through 180° by said swivel arm to which it is attached for inverting one of said first and second box frames, said swivel arms being positionable so that said first and second box frames are alignable one opposite the other for forming a complete casting mold, a conveyor device spaced laterally from said stations, and means for removing a complete casting mold from one of said stations and



for delivering it to said conveyor device, wherein the improvement comprises that said swivel unit includes a main column having an axis located centrally of said stations, means connected to said main column for rotating said main column about the axis thereof, the one said swivel arm mounted on and extending outwardly from said main column transversely of the column axis thereof, and a turning mechanism included in said swivel arm with said first box frame connected to said swivel arm for inverting said box frame connected thereto, at least one swivel column mounted within and extending in the axial direction of said main column, said swivel column having an axis disposed in parallel relation with the axis of said main column, means connected to said main column for rotating said swivel column about the column axis thereof relative to said main column, the another said swivel arm mounted on and extending outwardly from said swivel column transversely of the column axis thereof, and means connected to said main column for moving said swivel column in the axial direction thereof.

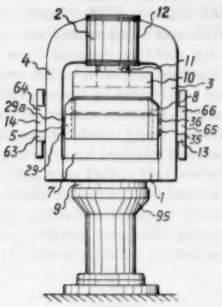
4,114,678
MOLD FORMING APPARATUS WITH MOLD FLASK BRACER MEANS

Erwin Bührer, Vögelingässchen 40, 8200 Schaffhausen, Switzerland

Filed Feb. 2, 1977, Ser. No. 764,953
Claims priority, application Switzerland, Sep. 14, 1976, 11636/76
Int. Cl.² B22C *15/02*
U.S. Cl. 164—207 11 Claims

1. In a mold forming apparatus for the production of casting molds in molding flasks operating to compress mold forming material contained within said mold flask, the improvement comprising bracer means including bracer elements acting in opposed relationship to each other to brace said mold flask and structural means located to be fixed in position relative to said mold flasks during compression of said mold forming material,

said bracer means operating to brace said mold flasks against said fixed structural means, said bracer elements comprising bracer bolts arranged to be adjusted with relation to said mold



flasks, said apparatus further comprising wedges which are mounted in slidable engagement relative to said fixed structural means in order to thereby operate to adjust the position of said bracer bolts against said mold flasks.

4,114,679

ARRANGEMENT FOR INTRODUCING A FLEXIBLE STARTER BAR INTO A CONTINUOUS CASTING PLANT

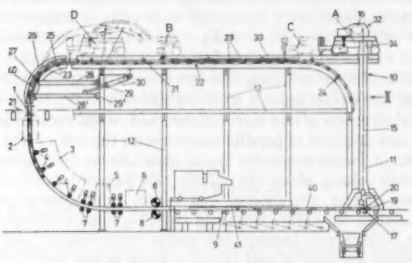
Lorenz Loibl, Baden, and Werner Scheurecker, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Feb. 16, 1977, Ser. No. 769,153

Claims priority, application Austria, Feb. 26, 1976, 1415/76; Mar. 26, 1976, 2216/76

Int. Cl.[2] B22D *11/08*

U.S. Cl. 164—426 **26 Claims**



1. In an arrangement for introducing a flexible starter bar, having a foot end, a head end and a starter bar head, into a continuous casting plant system of the type including a stationary supporting structure, a casting platform with a mould located on the structure, a strand guide arranged below the mould, a lifting means provided on the structure for gripping and lifting the starter bar, and a displacement means designed as a car traveling on the supporting structure and arranged to transport the starter bar and to introduce it into the continuous casting plant system, the improvement comprising a conveying means forming a conveying path whose center is stationary, which conveying means is arranged on the stationary supporting structure extending from the lifting means to the strand guide, the starter bar being guided on the conveying path by the displacement means, the conveying means having an arcuate front end part and an arcuate rear end part, and the arcuate front end part of the conveying means being pivotable into and out of an introduction position.

4,114,680

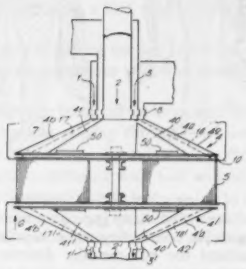
REGENERATIVE AIR PREHEATER FOR SEPARATE PREHEATING OF TWO OR MORE AIR-OR GAS STREAMS

Gerhard Kritzler, Freudenberg, and Paul Eckert, Wenden, both of Fed. Rep. of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,241

Int. Cl.[2] F28D *17/00*

U.S. Cl. 165—4 **10 Claims**



1. Rotary regenerative air preheater having

(a) a stationary regenerative heat-exchange mass having a central axis

(b) axial end faces of said mass

(c) first stationary ducting for conducting exhaust gas to and from said mass

(d) second stationary ducting for conducting air to and from said mass and comprising a plurality of separate ducts beyond each end face of the mass and within the first stationary ducting

(e) the said plurality of separate ducts comprising concentrically arranged ducts disposed coaxially with the mass

(f) a cowl at each axial end face of the mass for conducting air to or from the respective end face and the concentrically arranged ducts

(g) each cowl being rotatable to sweep the respective end face of the mass, in synchronism with the other cowl

(h) each cowl comprising a plurality of hoods, the cowl being rotationally symmetrically arranged with respect to the axis of the mass and each hood comprising radially extending and arcuately extending bounding walls

(j) each hood being sub-divided internally by dividing means including at least one radially extending dividing wall whereby each hood is sub-divided into a plurality of compartments having the same radial extent as the mass

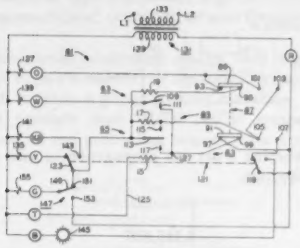
(k) corresponding compartments of the hoods at each axial end face of the mass being of corresponding angular extent and being at all times opposed to said corresponding compartments across the mass whereby to form a plurality of distinct air paths through the mass between the said compartments

(l) the dividing means including means for conducting flow of air to or from a given one only of the plurality of concentrically arranged ducts to or from given corresponding compartments only of the hoods at both axial end faces of the mass.

4,114,681
THERMOSTAT, METHOD OF OPERATING SUCH ELECTRICAL CIRCUIT AND METHOD OF HEATING A TEMPERATURE SENSING MEANS

Dann W. Denny, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 13, 1976, Ser. No. 750,280
Int. Cl.² G05D *23/30*
U.S. Cl. 165—26 **30 Claims**



1. A thermostat for regulating the temperature of a space in which the thermostat may be located comprising:

(a) a heating circuit;

(b) a cooling circuit;

(c) a post rotatably mounted in the thermostat;

(d) a bimetal element movable between selected positions in the thermostat and operable for sensing the temperature of the space, said bimetal element having a generally spiral configuration with a pair of radially inner and outer ends, said inner end being mounted to said post so that said bimetal element is conjointly rotatable with said post;

(e) a pair of switches, one of said switches being connected in both said cooling circuit and said heating circuit and adapted for switching operation therein at a pair of predetermined switch points and the other of said switches being connected in said heating circuit and adapted for switching operation therein at a predetermined switch point different than the switch points of said one switch;

(f) a bracket mounted to said bimetal element adjacent said outer end so as to be conjointly movable with said bimetal element and for supporting said switches, said bracket including means for establishing the predetermined switch points of said switches;

(g) a temperature selector manually movable within a predetermined range of temperature settings so as to set a preselected temperature of the space and drivingly associated with said post, said post being rotated so as to conjointly move said bimetal element to a respective one of its selected positions upon the manual movement of said temperature selector to set the preselected temperature;

(h) means manually operable for selectively enabling said heating circuit and said cooling circuit;

(i) a first resistor in said cooling circuit connected in shunt circuit relation with said one switch and energized when said cooling circuit is selectively enabled by said enabling means, said bimetal element in its respective one selected position being responsive to the sensed temperature and the anticipation heat supplied by said first resistor upon its energization to actuate said one switch to one of its predetermined switch points thereby to complete said cooling circuit and shunt said first resistor effecting its deenergization in the cooling circuit;

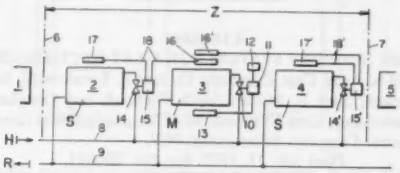
(j) a second resistor connected in said heating circuit and adapted for energization to supply anticipation heat to said bimetal element, said bimetal element in its respective one selected position being initially responsive to the sensed temperature to actuate said one switch to the other of its predetermined switch points thereby to complete said heating circuit and effect the energization of said second resistor to supply its anticipation heat to said bimetal element when said heating circuit is selectively enabled by said enabling means; and

(k) a third resistor connected in said heating circuit and adapted for energization to supply biasing heat to said bimetal element upon the enablement of said heating circuit by said enabling means.

4,114,682
APPARATUS FOR HEATING, COOLING OR AIR-CONDITIONING A ROOM

Vagn Valbjorn Knud, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 28, 1977, Ser. No. 781,576
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614432
Int. Cl.² B60H *1/00*
U.S. Cl. 165—39 **4 Claims**

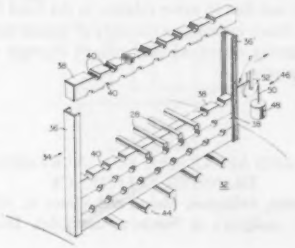


1. Apparatus for controlling the temperature of a room comprising at least two heat exchangers with one being a guide unit and all others being follower units, individual control means for each of said heat exchangers, room temperature sensor and setting means for controlling said individual control means of said guide unit, a pair of temperature sensors for jointly controlling said individual control means of each said follower unit to dependingly relate the temperature of the outgoing airstream of the associated follower unit to the temperature of the outgoing airstream of said guide unit, one sensor of said pair being in the outflowing air stream of said guide unit and the other sensor of said pair being in the outflowing air stream of the associated follower unit.

4,114,683
FLEXIBLE TUBE TYPE FLUID-FLUID HEAT EXCHANGER

Michel Francois Emile Jacques Verlinden, Brussels, Belgium, assignor to Hamon Sobelco S.A., Brussels, Belgium

Filed Jan. 19, 1977, Ser. No. 760,690
Claims priority, application France, Aug. 18, 1976, 76 25059
Int. Cl.² F28F *9/00*
U.S. Cl. 165—78 **12 Claims**



1. A fluid-fluid heat exchanger comprising a pair of headers, a plurality of flexible synthetic tubes, each of said plurality of tubes extending in a curved path between said pair of headers with the ends of each tube being in fluid communication with said pair of headers to provide a flow path between the headers

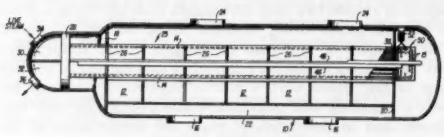
for one of the heat exchange fluids, said plurality of tubes being further arranged in a plurality of spaced superimposed layers with the spaces therebetween providing a flow path for the other of the heat exchange fluids, a plurality of spaced generally radially disposed spacers engaging and maintaining the flexible tubes in their spaced superimposed layers and in their generally curved path, wherein each spacer has a generally plate shape disposed radially with respect to the curvature of said wall and each spacer having individual apertures for reception of the tubes of the exchanger, further wherein each spacer comprises an assembly of superimposed strips having on two opposed longitudinal sides rounded notches the radius of which is equal to, or greater than, the radius of a cross-section of said tubes, the notches of adjacent strips defining said individual apertures, and wherein said strips are maintained at their ends by U-section members disposed in the plane of the spacer element.

4,114,684

TUBE SUPPORT SYSTEM FOR HEAT EXCHANGER

Donald S. Jenis, Cape Elizabeth; Thomas A. Kuczkowski, Scarborough; Jack S. Mazer, South Portland, and Douglas F. Westerkamp, Cape Elizabeth, all of Me., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,611
Int. Cl.[2] F28F *7/00*
U.S. Cl. 165—82 **16 Claims**



1. In a heat exchange apparatus including a cylindrical shell, a perforated tube sheet located within one end of the shell, and a bundle of elongated, U-shaped tubes transiting the length of the interior of the shell, said tubes having legs terminating in the perforations of the tube sheet and having U-bends located in the opposite end of the shell, a tube support system comprising:

(a) a fixed frame mounted in the shell adjacent the tube sheet and extending along the majority of the length of the bundle, said frame including a plurality of tube support plates positioned at spaced intervals along the tube legs, said plates having oversized perforations through which the tube legs pass; and

(b) a floating frame mounted on the tube legs adjacent the U-bends and free to move relative to the fixed frame, said floating frame including a plurality of spaced tube support plates having oversized perforations through which the tube legs pass.

4,114,685

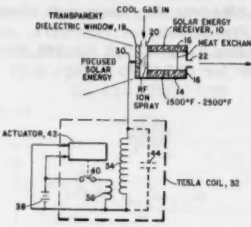
METHOD AND APPARATUS FOR INCREASING HEAT TRANSFER EFFICIENCY

Jacob Schwartz, Arlington, Mass., and Victor A. Misek, Hudson, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 8, 1976, Ser. No. 647,377
Int. Cl.[2] F28F *13/02, 13/16*
U.S. Cl. 165—96 **24 Claims**

1. Apparatus for enhancing the efficiency of a heat exchanger having a fluid conducting and confining surface and a fluid flowing in a pre-determined direction therein, comprising:

means for establishing an RF field within said fluid such that no stationary oscillating field is set up within the fluid and



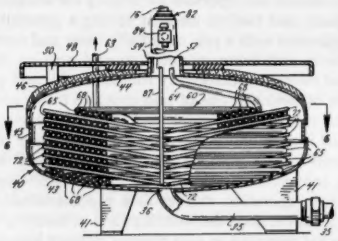
for establishing a net ion propagation in said pre-determined direction.

4,114,686

HOT WATER SYSTEM

Paul Mueller, and Ray A. Prine, both of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Division of Ser. No. 671,579, Mar. 29, 1976, Pat. No. 4,041,726.
This application Jun. 27, 1977, Ser. No. 810,026
Int. Cl.[2] B22D *19/00;* B22C *13/14*
U.S. Cl. 165—110 **10 Claims**



1. A condenser comprising a housing having a water inlet and a water outlet, a vertical riser tube, means connecting the lower end of the vertical riser tube to the water outlet of the housing, a coil within the housing defining a refrigerant passage therethrough, said coil having multiple coil layers, said layers being separated to provide water passages therebetween, at least some of the layers having multiple windings, the layers being connected to form a continuous condenser coil with a refrigerant passage inlet at one end and a refrigerant passage outlet at the other.

4,114,687

SYSTEMS FOR PRODUCING BITUMEN FROM TAR SANDS

Joy T. Payton, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,123
Int. Cl.[2] E21B *43/04, 43/08, 43/24*
U.S. Cl. 166—51 **8 Claims**

1. A system for forming a cavity in unconsolidated petroliferous formation sands for producing bitumen from a subterranean reservoir of tar sands as the unconsolidated petroliferous formation sands from an open well extending down in to the unconsolidated petroliferous sand formation comprising,

(a) screen means positioned in the well large enough to pass a majority of the formation sand and small enough to retain a gravel packing material,

(b) high pressure fluid lateral nozzle means releasable re-

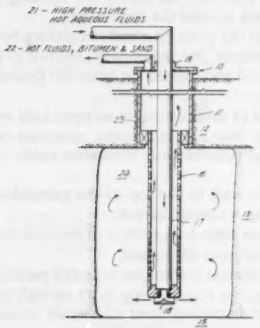
tractably secured for protrudance below said screen means, and

(c) wash pipe means annularly releasably internally mounted within said screen means and connected to said high pressure fluid lateral nozzle means for washing out a cavity in the sand formation.

3. A system for producing bitumen from a subterranean reservoir of tar sands as unconsolidated petroliferous formation sands from an open walled well segment extending down in to the unconsolidated petroliferous sand formation comprising,

(a) screen means positioned in the well segment large enough to pass a majority of the formation sand and small enough to retain a gravel packing material,

(b) high pressure fluid lateral nozzle means releasably mounted on and protruding below said screen means,



(c) high pressure fluid wash pipe means releasably removably annularly mounted in said screen means and connectable to said nozzle means for washing out a cavity in the sand formation,

(d) said high pressure fluid wash pipe means being replaceable with a production tube means,

(e) said production tube means being packable intermediate the ends of the screen for forming an annulus means in the well and screen means, and

(f) said production tube means comprises means for ejecting a consolidating gravel packing material from the screen means upper portion above the packer into the cavity for forming the consolidated gravel pack around the screen means lower portion for improved production of bitumen from the consolidated petroliferous formation sands.

4,114,688

MINIMIZING ENVIRONMENTAL EFFECTS IN PRODUCTION AND USE OF COAL

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology Inc., Denver, Colo.

Filed Dec. 5, 1977, Ser. No. 857,102
Int. Cl.[2] E21B *43/24, 43/26;* E21C *43/00*
U.S. Cl. 166—246 **14 Claims**

1. A method of gasifying coal in situ in concert with gasifying coal in aboveground facilities comprising the steps of:

establishing fluid injection and fluid removal passages connecting an underground coal deposit to a surface location,

establishing a communication passage through the said underground coal interconnected to the said fluid injection and fluid removal passages,

establishing an aboveground coal gasification means,

igniting the underground coal in the said communication passage,

igniting the coal in the said aboveground coal gasification means,

injecting an oxidizer in the said fluid injection passage,

injecting an oxidizer in the said aboveground coal gasification means,

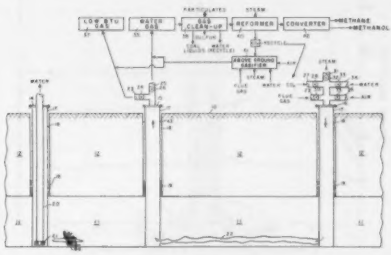
gasifying the said underground coal into flue gas,

gasifying the coal in the said aboveground gasification means,

terminating the said injection of an oxidizer in the said aboveground coal gasification means,

injecting the said flue gas into the said aboveground coal gasification means, and

capturing the produced gases from the said aboveground coal gasification means.



14. A method of destroying contaminants in the underground water adjacent to the reaction zone of an in situ coal gasification project comprising the steps of

drilling a water interceptor well from the surface of the earth into the water bearing formation containing contaminated water,

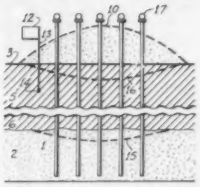
injecting microorganisms through the water interceptor well into the said contaminated water, the said microorganisms having the capability of destroying the contaminants in the underground water.

4,114,689

RECOVERY OF PETROLEUM

Newton Bradford Dismukes, 2952 Buttonwood Dr., Carrollton, Tex. 75006

Filed May 25, 1977, Ser. No. 800,218
Int. Cl.[2] E21B *43/00, 43/01*
U.S. Cl. 166—249 **30 Claims**



1. The method of recovering petroleum substance from an underground accumulation in earth strata comprising:

(a) drilling a first well into said strata,

(b) placing a substantial mass above said accumulation to compact said earth strata and reduce the porosity thereof, and

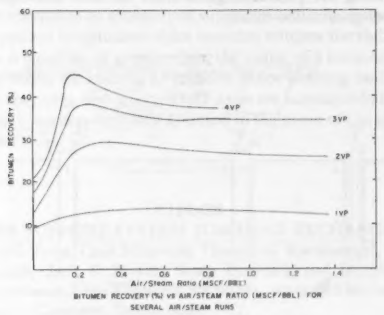
(c) expelling said petroleum substance into said first well.

4,114,690

LOW-TEMPERATURE OXIDATION METHOD FOR THE RECOVERY OF HEAVY OILS AND BITUMEN

Phillip J. Cram, Calgary, and David A. Redford, Fort Saskatchewan, both of Canada, assignors to Texaco Exploration Canada Ltd., Calgary, Canada

Filed Jun. 6, 1977, Ser. No. 804,129
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—261 **15 Claims**



BITUMEN RECOVERY (%) vs AIR/STEAM RATIO (MSCF/BBL) FOR SEVERAL AIR/STEAM RUNS

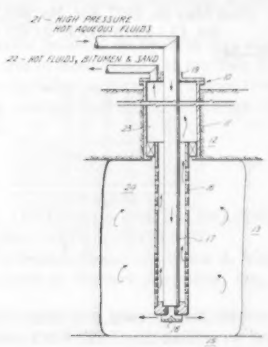
1. In a method for the recovery of hydrocarbons from a subterranean tar sand formation traversed by at least one injection well and at least one production well, and having fluid communication therebetween, wherein a mixture of steam having a quality less than 100% and an oxygen-containing gas is injected via said injection well, said mixture being at the temperature correpsonding to the temperature of saturated steam at the pressure of said formation, and fluids are produced via said production well, the improvement comprising maintaining the ratio of the free oxygen in the oxygen-containing gas to the steam in the range of about 0.03 to 0.130 MSCF of oxygen per barrel of steam, measured as water.

4,114,691

METHOD FOR CONTROLLING SAND IN THERMAL RECOVERY OF OIL FROM TAR SANDS

Joy T. Payton, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,124
Int. Cl.[2] E21B *43/04, 43/08, 43/24*
U.S. Cl. 166—276 **11 Claims**



1. A method of sand control in an open hole type of completion extending into a subterranean reservoir to tar sands as unconsolidated petroliferous formation sands comprising the steps of,

(a) drilling a well to the top of the petroliferous formation and setting a casing therein,
(b) drilling an open hole section of the well to the bottom of the petroliferous formation,
(c) setting a screen in the open hole and packing it off against the casing, the screen being large enough to pass a majority of the formation sand and small enough to retain a packing material,
(d) running a wash pipe down into the screen for connecting to a nozzle at the bottom of the screen,
(e) circulating hot aqueous fluids through the wash pipe and from the lower end thereof for melting the oil or tar for forming a cavity of a predetermined size around the screen and open hole,
(f) removing the nozzle from the wash pipe,
(g) without stopping the flow of fluids into the well, ejecting a consolidating gravel packing material out the bottom of the wash pipe into the cavity for forming a consolidated gravel pack around the screen, and
(h) removing the wash pipe and circulating hot fluids out the screen bottom for secondary recovery production of sand-free oil and melted tar from the petroliferous formation.

7. A method of said control in an open hole type of completion extending into a subterranean reservoir of tar sands as unconsolidated petroliferous formation sands comprising the steps of,

(a) drilling a well to the top of the petroliferous formation and setting a casing therein,
(b) drilling an open hole section of the well to the bottom of the petroliferous formation,
(c) setting a screen in the open hole and packing it off against the casing, the screen being large enough to pass a majority of the formation sand and small enough to retain a packing material,
(d) running a wash pipe down into the screen for connecting to a nozzle at the bottom of the screen,
(e) circulating hot aqueous fluids through the wash pipe ana from the lower end thereof for melting the oil or tar for forming a cavity of a predetermined size around the screen and open hole,
(f) removing the nozzle from the wash pipe,
(g) packing a tube midway down into the screen, and
(h) in a continuous uninterrupted sequence ejecting a consolidating gravel packing material from the upper screen portion above the packer into the cavity to form a consolidated gravel pack around the lower screen portion for improved sand control when producing sand-free crude oil from the unconsolidated petroliferous formation.

4,114,692

METHOD FOR CEMENTING HIGH TEMPERATURE WELLS

Julius P. Gallus, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 700,387, Jun. 28, 1976, Pat. No. 4,069,870. This application Oct. 25, 1977, Ser. No. 845,028
Int. Cl.[2] E21B *33/14*
U.S. Cl. 166—293 **11 Claims**

1. A method for placing a hardened cement mass having improved resistance to degradation of its ultimate permeability and compressive strength when exposed to high temperatures, in a confined space in fluid communication with a well, comprising:

forming a hardenable slurry comprised of a cement system and a water-containing liquid vehicle, said cement system comprising an oil well cement and a carbon-containing cement additive having between about 1 and 15 weight percent of volatile material, and said cement additive being present in an amount, up to 20 weight percent of said cement system, effective to improve the resistance to degradation of the ultimate permeability and compressive strength of said cement mass; and

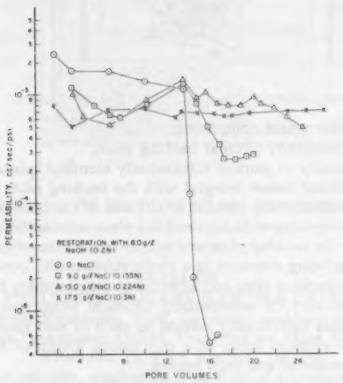
introducing said hardenable slurry through said well and into said confined space wherein said slurry hardens to form said cement mass.

4,114,693

METHOD OF TREATING FORMATION TO REMOVE AMMONIUM IONS WITHOUT DECREASING PERMEABILITY

William R. Foster, Dallas, and Earl S. Snavely, Jr., Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,686
Int. Cl.[2] E21B *43/27, 43/28*
U.S. Cl. 166—305 R **8 Claims**



1. A method of treating a subterranean clay-containing formation having ammonium ions absorbed in the clay, the method comprising:

flushing said formation with an alkaline solution comprising:

an aqueous solution of a strong, soluble, alkaline compound capable of converting the ammonium ions to ammonia; and

a monovalent metal salt capable of preventing the swelling of said clay; and

removing said ammonia from said formation.

4,114,694

NO-SHOCK PRESSURE PLUG APPARATUS

Robert W. Dinning, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed May 16, 1977, Ser. No. 797,328
Int. Cl.[2] E21B *23/06*
U.S. Cl. 166—318 **10 Claims**

1. Releasable closure apparatus, for selectively closing a passage, comprising:

(a) generally tubular housing means, including a passage therethrough and pressure chamber means for receiving fluid pressure from said passage;

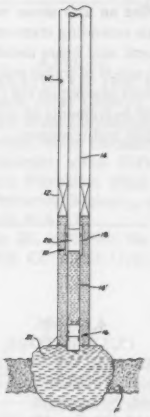
(b) seal means for selectively closing said passage when said seal means is in sealing configuration;

(c) releasable anchoring means, moveable between an anchoring configuration for maintaining said seal means in said sealing configuration, and a release configuration for releasing said seal means to move out of said sealing configuration;

(d) piston means moveable in a first direction relative to said housing means, propelled by fluid pressure so received by said pressure chamber means, and moveable in a second direction generally opposite said first direction, propelled by spring means;

(e) restraining means for selectively confining said anchoring means in said anchoring configuration, and moveable, by said piston means operating thereon when so moved in said second direction, to release said anchoring means to move out of said anchoring configuration to said release configuration; and

(f) releasable lock means for preventing motion of said piston means relative to said housing means, which lock means



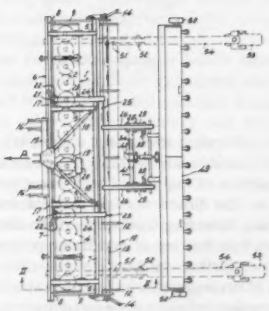
may be released by fluid pressure being received by said pressure chamber means to propel said piston means in said first direction whereby said piston means is then released to be so moved in said second direction to so operate on said restraining means to thereby permit said anchoring means to release said seal means.

4,114,695

ROTARY HARROW WITH PIVOTABLE COUPLING ASSEMBLY

Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Aug. 31, 1976, Ser. No. 719,279
Claims priority, application Netherlands, Sep. 2, 1975, 7510308
Int. Cl.[2] A01B *49/06, 33/06*
U.S. Cl. 172—47 **15 Claims**



1. A rotary harrow having a row of rotatable soil working members on a frame and drive means connected to rotate said soil working members about upwardly extending axes defined by upwardly extending shafts journalled in an elongated portion of the frame, said frame including a forward beam spaced apart from a rear beam and these two beams being substantially horizontal, said forward beam having coupling means for connection to a prime mover and a coupling assembly positioned to the rear of said elongated frame portion, said assem-

bly comprising two spaced apart coupling points and a third coupling point that is positioned between the two coupling points when viewed in plan, the two coupling points and said third point being mounted on common support means, said support means forming part of said assembly, said assembly being interconnected by beam members to said forward beam by pivots which define an axis about which the assembly is pivotable and said axis extending transverse to the direction of travel of the implement, said beam members extending generally parallel to the direction of travel and positioned above said rear beam, said members bearing on the rear beam which limits the downward pivotal movements of said assembly about said pivots during operation and transport.

4,114,696

CULTIVATORS

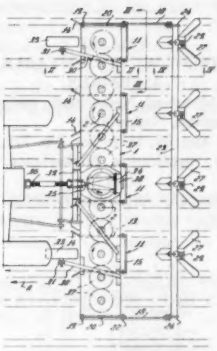
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Division of Ser. No. 617,419, Sep. 29, 1975, Pat. No. 4,046,202, which is a continuation of Ser. No. 473,572, May 28, 1974, abandoned. This application Jun. 15, 1977, Ser. No. 806,930

Claims priority, application Netherlands, May 28, 1973, 7307376

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **8 Claims**



1. A soil cultivating implement comprising a frame and a plurality of rotatable soil working members mounted on an elongated portion of said frame, said frame portion extending transverse to the direction of implement travel, elongated support means extending transverse to the direction of travel and positioned to the rear of said frame portion, said support means carrying further soil working means that extends across at least part of the working width of the soil working members, adjustment means including arms and at least one pivot on each arm adjacent said support means interconnecting the latter to the frame portion, the horizontal working level of said further soil working means relative to said frame portion and rotatable soil working members being regulated with said adjustment means, said support means being angularly adjustable about a substantially horizontal axis defined by said pivot, means retaining said support means and further soil working means in a chosen angular setting, said arm having a second pivot that connects that arm to the frame portion and locking means fixing said arm in position relative to the frame portion.

4,114,697

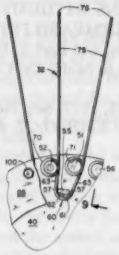
FINGER WHEEL

James J. Carlucci, 716 Monroe Ave., Los Banos, Calif. 93635

Filed Apr. 18, 1977, Ser. No. 788,263

Int. Cl.[2] A01B *21/04, 35/26*

U.S. Cl. 172—543 **7 Claims**



4. A finger wheel comprising:

A. a substantially circular backing plate;

B. a plurality of pairs of substantially identical substantially cylindrical bosses integral with the backing plate having axes substantially parallel to the axis of the backing plate and projecting ends disposed in a plane substantially parallel to the backing plate and axially spaced therefrom, said bosses being disposed in a circle substantially concentric to the backing plate and adjacent to the periphery thereof;

C. a plurality of substantially identical bifurcated finger elements individually related to each of said pairs, each finger element being of a continuous length of resilient wire material and each having

(1) a pair of helical coils individually wound in circumscribing relation on the bosses of its respective pair of bosses,

(2) a portion interconnecting the coils, and

(3) a pair of fingers individually continuous with the coils and extended outwardly from the backing plate; and

D. a clamping plate releasably mounted on the backing plate in facing engagement with the projecting ends of the bosses to capture the coils on the respective bosses about which they are wound.

4,114,698

METHOD AND APPARATUS FOR TUNNELING UPWARDLY

Daniel R. Webb, Santa Ana; John R. Steinke, Fountain Valley; Robert W. Berry, Brea, and Stanard R. Funsten, San Marino, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Feb. 20, 1975, Ser. No. 551,083

Int. Cl.[2] E21B *7/00*

U.S. Cl. 173—1 **6 Claims**

1. A vertical thrust boring machine comprising:

a drill string including a series of threadedly connected drill stem sections, the lowermost section having a spline connection on its lower end;

a rotary table above which said drill string extends in an upwardly direction;

a drive coupling ring attached to said rotary table to move therewith, said drive coupling ring having a spline connection adapted to matingly engage the spline connection of said lowermost drill stem section;

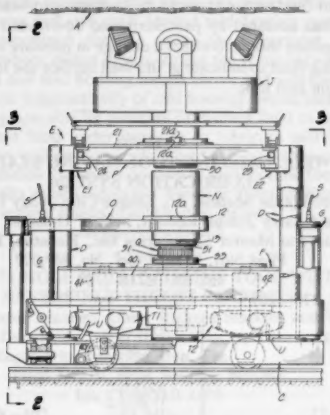
power driven means for selectively rotating said table;

power driven means for selectively raising or lowering said table;

holding means selectively operable for grasping the drill string above the elevation of said lowermost drill stem section, so as to fix the vertical position of the string while said lowermost section is being attached or detached; and

a clamp assembly encircling and rotatably supported from

said drive coupling ring, said clamp assembly including means for selectively threadedly engaging a male thread



formed on the lower end of said lowermost drill stem section.

4,114,699

PNEUMATIC ROTARY HAMMER DEVICE

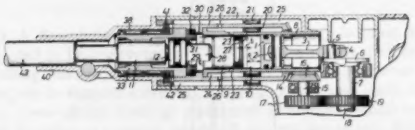
Otto Wolf, Kirchheim, Teck, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Jan. 19, 1977, Ser. No. 760,656

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602239; Jan. 22, 1976, 7601636

Int. Cl.[2] B25D 9/00

U.S. Cl. 173—109 5 Claims



1. In a hammer drill having a housing; a drive means supported in the housing; a cylinder supported in the housing; a drive piston received for reciprocation in the cylinder and being connected to the drive means for actuation by the drive means; a percussion body received for reciprocation in the cylinder; means defining an air cushion in the cylinder between the drive piston and the percussion body for driving the percussion body by the drive piston by the intermediary of the air cushion; and a tool holder supported in the housing and exposed to the impacting effect of the percussion body; the improvement comprising

(a) means for stationarily affixing said cylinder to said housing;

(b) a hollow drive shaft rotatably supported in said housing and surrounding said cylinder and being connected to said tool holder;

(c) said drive means including

(1) an intermediate shaft rotatably supported in said housing;

(2) a drive gear affixed to said intermediate shaft;

(3) a driven gear affixed to said hollow drive shaft; said drive gear meshing with said driven gear for continuously rotating said hollow drive shaft during actuation of said drive piston by said drive means;

(d) means defining air equalization ports in said hollow shaft;

(e) means defining air ports in said cylinder in the zone of said air cushion; said air ports cooperating with said air equalization ports; and

(f) a safety coupling connecting said hollow shaft with said tool holder.

4,114,700

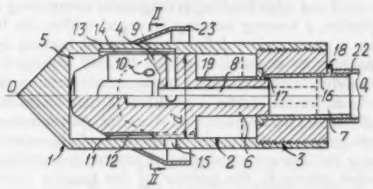
PNEUMATIC APPARATUS OF THE PERCUSSIVE TYPE

Khaim Berkovich Tkach, ulitsa Gogolya, 17, kv. 49; Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 13; Boris Nikolaevich Smolyanitsky, ulitsa O.Dundicha, 27, kv. 18; Vladimir Dmitrievich Plavskikh, ulitsa Gogolya, 233/1, kv. 34, and Vladimir Petrovich Boginsky, ulitsa Lenina, 59, kv. 58, all of Novosibirsk, U.S.S.R.

Filed Mar. 28, 1977, Ser. No. 782,100

Int. Cl.[2] E21B 11/02

U.S. Cl. 175—19 6 Claims



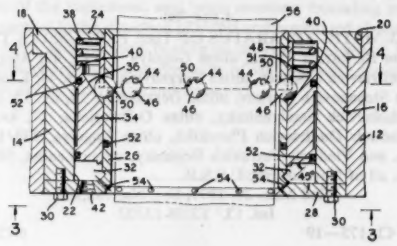
1. A pneumatic apparatus of the percussive type for driving holes in the ground by compacting same comprising a pointed-nose hollow cylindrical body closed at the back and provided with grooves in the inner surface of its forward portion; a stepped striker disposed in said body so as to enable reciprocation by the action of compressed air, a forward working chamber being defined by said body and said striker, said forward working chamber recurrently connecting to a source of compressed air and to the atmosphere for discharging air, a rear working chamber defined by said body and said striker, said rear working chamber being permanently connected to the source of compressed air, a space defined by a rear end face of a large step of said striker, a cylindrical surface of the small step of said striker and said body, said striker being provided with a central passage connected to the rear working chamber and with at least two radial passages which open into said central passage and onto an outer cylindrical surface of the large step of said striker, the radial passages being displaced relative to each other circumferentially and longitudinally along the axis of said body, said striker being disposed in said body so as to enable rotation about the axis of said body and so as to be set into either of two locked positions relative to said body wherein rotation about the axis of said body is prevented, the locked positions corresponding to forward and backward movement of said apparatus, passages for introducing compressed air into said forward working chamber being defined by the outer cylindrical surface of the larger step of said striker and by grooves in said body, ports provided in the side wall of said body at its rear end between the radial passages of said striker for the discharge of air from said forward working chamber; a means of performing the control rotation of said striker in said body about the axis thereof and of locking the striker in either of the two said locking positions, in each of said locked positions one of the radial passages of said striker is connected to the passages defined by the outer cylindrical surface of the large step of said striker and the grooves in said body for admitting compressed air into the forward working chamber.

4,114,701

DRILL ROD TABLE BUSHING ARRANGEMENT

Edward J. Bouplon, Streetsboro, Ohio, assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,246
Int. Cl.² E21B *41/00*
U.S. Cl. 175—84 **5 Claims**



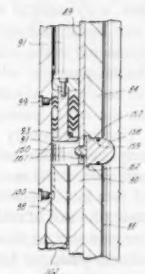
1. A drill rod table bushing arrangement comprising a bushing cylinder, a bearing housing arranged within the bushing cylinder, a piston cavity defined between the bushing cylinder and the bearing housing, a piston slidably arranged in the piston cavity, means to admit pressurized medium into the cavity to move the piston, a plurality of ball means movable inwardly of the bearing housing when the piston is moved by the pressurized medium, and a plurality of passageways arranged in the bearing housing to jet pressurized medium from the piston cavity to the interior of the bearing housing to restrict flow of drill cuttings between the bearing housing and a drill rod surrounded by the bearing housing when the bushing arrangement is being utilized.

4,114,702

WELL DRILLING TOOL WITH LUBRICANT LEVEL INDICATOR

William C. Maurer; William J. McDonald, Jr., and Charles E. Ward, all of Harris County, Tex., assignors to Maurer Engineering Inc., Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,976
Int. Cl.² E21B *1/06*
U.S. Cl. 175—107 **11 Claims**



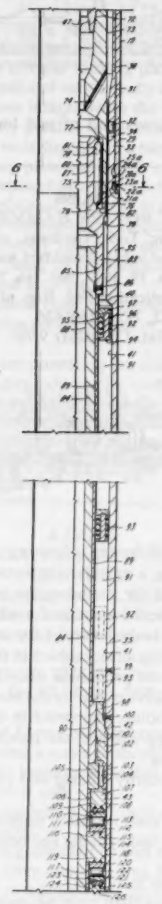
1. A down hole well drilling tool adapted for connection at one end to the lower end of a drill string and at the other end to a drill bit to be driven thereby, said drilling tool comprising tubular housing means and rotary shaft means supported therein and extending therefrom and adapted to support a drill bit, motor means in said housing means actuated by flow of drilling fluid therethrough and operable to rotate said shaft means, bearing means in said housing means supporting said rotary shaft means, lubricant fluid filling the space between said housing means and said shaft means around said bearing means and for a predetermined distance above said bearing means, piston means sealing the space between said shaft means and said housing means above said lubricant fluid and moveable longitudinally of said housing means, said piston means being operable by pressure of drilling fluid to maintain said lubricant fluid under pressure to lubricate said bearing means, and means actuated by predetermined downward movement of said piston means to effect a change in pressure or flow rate of drilling fluid to indicate at the well surface the loss of lubricant from said tool.

4,114,703

WELL DRILLING TOOL HAVING SEALED LUBRICATION SYSTEM

Lawrence Wayne Matson, Jr., League City; Jeddy Darr Nixon, Jr., and Larry Joseph Remont, both of Houston, all of Tex., assignors to Maurer Engineering Inc., Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,977
Int. Cl.² E21B *1/06*
U.S. Cl. 175—107 **10 Claims**



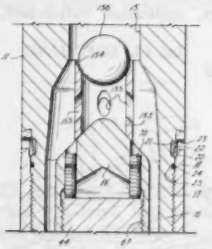
1. A downhole well drilling tool adapted for connection at one end to the lower end of a drill string and at the other end to a drill bit to be driven thereby, the drilling tool comprising tubular housing means and rotary shaft means supported therein and extending therefrom and adapted to support a drill bit, motor means in said housing means actuated by flow of drilling fluid therethrough and operable to rotate said shaft

means, bearing means in said housing means comprising a plurality of bearing members spaced longitudinally of and supporting said rotary shaft means against radial and longitudinal thrust loads, lubricant fluid filling the space between said housing means and said shaft around said bearing means and for a predetermined distance above the uppermost of said bearing members, piston means sealing the space between said shaft means and said housing means above said lubricant fluid and moveable longitudinally of said housing means, said piston means being operable by pressure of drilling fluid to maintain said lubricant fluid under pressure to lubricate said bearing means, rotary sealing means positioned above and spaced from said piston means to prevent contact of drilling fluid therewith, and hydraulic means applying pressure from drilling fluid above said sealing means to said piston means.

4,114,704
DOWN HOLE WELL DRILLING TOOL WITH REVERSIBLE THRUST BEARINGS

William Casper Maurer; Albert Richard Sinclair, and William Jesse McDonald, Jr., all of Harris County, Tex., assignors to Maurer Engineering Inc., Houston, Tex.

Filed Nov. 9, 1977, Ser. No. 849,988
Int. Cl.² E21B *1/06*
U.S. Cl. 175—107 **12 Claims**



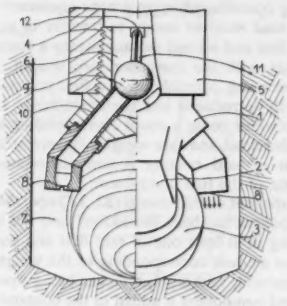
1. A downhole well drilling tool comprising housing means adapted to be connected to a drill string, a rotary shaft in said housing means and extending downward therefrom and adapted to support a drill bit, means to rotate said shaft, upper and lower thrust bearings positioned around said shaft within said housing to support said shaft against oppositely directed vertically extending forces, said upper thrust bearings supporting said shaft against upward thrust during drilling operation, said lower thrust bearings supporting downward thrust of said shaft when lifted out of drilling operation, and means operable to shift the relationship of said lower thrust bearings and said shaft to cause said shaft to be supported on said lower thrust bearings during drilling operation.

4,114,705
ROCK DRILLING TOOL HAVING PULSED JETS

Daniel Milan, Grenoble, France, assignor to Societe B.V.S., Grenoble, France

Filed Apr. 13, 1977, Ser. No. 787,264
Claims priority, application France, May 26, 1976, 76 15976
Int. Cl.² E21B *9/08*
U.S. Cl. 175—340 **6 Claims**

1. A drilling tool for causing mechanical destruction of rock in a drill hole and for circulating pressurized drilling fluid to remove rock debris from the drilling hole, said tool comprising a body, means mounted on the body for mechanically breaking up rock, said body having a distribution chamber in communication with an inlet conduit for drilling fluid and with two outlet ducts, each of said outlet ducts having one end projecting into said distribution chamber and an opposite end, a respective calibrated nozzle connected to each of said opposite ends of said outlet ducts and which, when the tool is in use, is directed towards a cutting face at the bottom of the drill hole, said nozzles being directed towards opposite points on the hole bottom, a ball in said distribution chamber which, in the absence of any external force, occupies an equilibrium position in which said one ends of said outlet ducts are open, and which is movable between two end positions in each of which the ball closes off one end of a respective one of said outlet ducts, said ball being arranged to be unstable when said inlet conduit



receives drilling fluid at the normal operating pressure and flow rate, said ball being then subjected to a combination of hydraulic and mechanical forces which causes the ball to oscillate between its said two end positions so that the drilling fluid is directed onto the bottom of the drill hole in the form of two pulsed jets, the rate in each jet varying between zero and a maximum value as the jets produce opposed flows of mud.

4,114,706
ELECTRICAL WEIGHING APPARATUS

Enrico Realini, Uster, and Werner Langenegger, Volketswil, both of Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland

Filed May 11, 1977, Ser. No. 796,043
Claims priority, application Switzerland, Jun. 1, 1976, 6851/76
Int. Cl.² G01G *19/22, 13/14*
U.S. Cl. 177—70 **11 Claims**

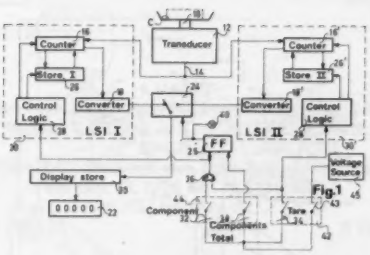


Fig. 1

1. Electrical weighing apparatus, comprising
(a) load receiver means for receiving a load to be weighed;
(b) transducer means for producing a number of pulses corresponding to the instantaneous weight of one or more components placed on said load receiver means;
(c) pulse counter means for continuously counting the number of pulses produced by said transducer means;
(d) display means for displaying the instantaneous count of said counter means;
(e) first and second storage means selectively operable to store instantaneous counts of said counter means, respectively; and
(f) control means for selectively operating said first and second storage means to store certain counts of said

counter means, respectively, and to subsequently subtract the stored counts from subsequent pulse counts, respectively, said control means including

(1) tare switch means (**34, 34'**) operable when the load receiver means is empty for transferring to at least one of said first and second storage means from said counter means a count corresponding to the deadload weight of said load receiver means, said tare switch means also being operable when an empty container is placed on said load receiver means to transfer to at least one of said first and second storage means a count that corresponds with the container tare weight, said storage means being operable after a first component is subsquently introduced into the container to subtract from the counter count a count corresponding to the sum of the deadload and tare weights, whereby the displayed count of said counter means corresponds with the weight of the first component;

(2) component switch means (**32, 32'**) operable after a first component has been introduced into the container for storing in at least one of said first and second storage means a count corresponding to the weight of the first component, said storage means being operable after a second component is added to the container to subtract from the counter count a count corresponding to the sum of the deadload, tare and first component weights, whereby the displayed count of said counter means corresponds with the weight of the second component; and

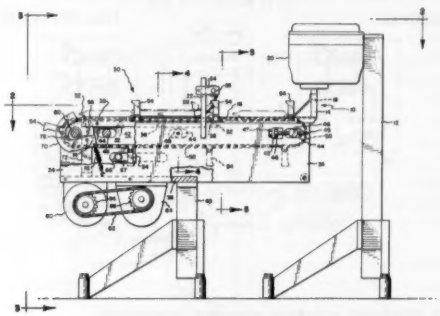
(3) components total switch means (**38, 38'**) for subtracting from the count of said counter means after the addition of the second component to the container a count corresponding to the deadload and tare weights, whereby the displayed count of said counter means is a function of the total weight of the two components.

4,114,707

WEIGHING AND TRANSPORTING SYSTEM

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Jan. 13, 1977, Ser. No. 758,918
Int. Cl.[2] G01G *19/00*
U.S. Cl. 177—145 **13 Claims**



1. An apparatus for transporting weighed articles rapidly away from a weighing station, including a scale, to a precisely located predetermined lateral position with the center of the article positioned at said lateral position, while clearing the weighing station in preparation for receiving the next article to be weighed, wherein said apparatus comprising:

a. a weigh-platform operatively connected to said scale;

b. independent support means which may be positioned adjacent to said weigh-platform for receiving and supporting weighed articles placed thereon after discharge from said weigh-plaform;

c. means adjacent to said weigh-platform for engaging and discharging weighed articles from said weigh-platform to said independent support means and for moving said weighed articles away from said weigh-plaform, said means including a pushing means which follows a closed continuous non-reversing path;

d. detecting means mounted so as to be positionally adjustable along the path of said pushing means for detecting the position of said pushing means and for generating a control signal indicative thereof; and

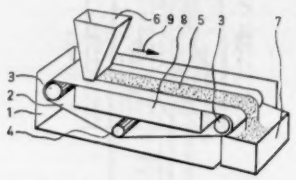
e. means responsive to said control signal and operatively connected to said article engaging and moving means for intermittently driving said article engaging and moving means in a non-reversing, start-stop manner so that a succession of weighed articles may be intermittently discharged from said weigh-platform and whereby the stationary position of said pushing means may be adjustably regulated by adjustably positioning said detecting means.

4,114,708

CONVEYOR TYPE SCALE

Kaspar Saner, Dubendorf, Switzerland, assignor to K-Tron Soder AG, Niederlenz, Switzerland

Filed Jun. 13, 1977, Ser. No. 806,212
Claims priority, application Switzerland, Jun. 16, 1976, 7773/76
Int. Cl.[2] G01G *11/00*
U.S. Cl. 177—145 **7 Claims**



1. A conveyor type scale comprising:

a stand;

a carrier attached to the stand;

a conveyor belt resting upon said carrier;

means for measuring a load;

transmitting means for placing the carrier in operational contact with the measuring means;

said carrier including two tables;

first link means connecting said two tables to one another and second link means connecting each table to said stand;

each link means including at least one link spring.

4,114,709

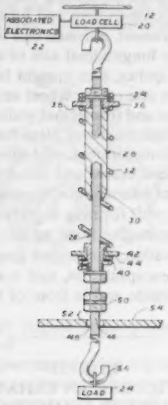
ELECTRONIC SCALE LOAD CELL PROTECTOR

Maxwell E. Jacobs, Brooklyn, and Eric R. Aaldenberg, Bayside, both of N.Y., assignors to Detecto Scales, Inc., Brooklyn, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,314
Int. Cl.[2] G01G *23/02*
U.S. Cl. 177—156 **5 Claims**

1. An electronic weighing device comprising: a frame; a load cell secured to said frame; weight receiving means; a first weight transmission linkage affixed to said cell; a second weight transmission linkage affixed to said weight receiving means; a preloaded coil spring extending between and connecting said linkages and adapted to move integrally therewith, said spring being preloaded by a force slightly less than the maximum force to which said load cell can safely be subjected;

and a stop member affixed to one of said linkages to engage portions of the frame if said spring preload force is exeeded,



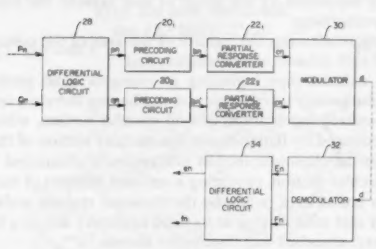
said frame portions being in the path of movement of said one linkage when a weight is applied to said receiving means.

4,114,710

CARRIER REGENERATION CIRCUIT

Tadayoshi Katoh, and Eiji Itaya, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1976, Ser. No. 716,183
Claims priority, application Japan, Aug. 20, 1975, 50-100762
Int. Cl.[2] H04L *27/24*
U.S. Cl. 178—67 **7 Claims**



1. A carrier regeneration circuit for regenerating a carrier from a QAM signal produced by a quadrature partial response modulation system which amplitude modulates quadrature-related carriers of a common frequency with respective ones of two parallel series of signals subjected to partial response conversion, said carrier regeneration circuit comprising:

probability decision means for making a decision as to the received data code in accordance with respective probabilities of generation of specified, demodulated data code combinations, and for generating a predetermined output corresponding to said decided, received data code; and

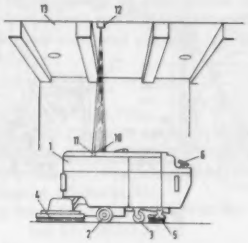
means for regenerating said carrier, said regenerated carrier having a phase ambiguity, and for maintaining the phase ambiguity of the regenerated carrier at a multiple of 90° by selectively shifting the phase of the regenerated carrier by 45° in response to said predetermined output of said probability decision means.

4,114,711

FLOOR TREATING MACHINES

John Thomas Wilkins, Bushey Heath, England, assignor to R. G. Dixon & Company Limited, Wembley, England

Continuation-in-part of Ser. No. 647,719, Jan. 9, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,727
Claims priority, application United Kingdom, Jan. 10, 1975, 1154/75
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.5 **4 Claims**



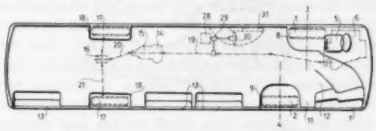
1. In a floor treating machine comprising laterally spaced drive wheels, separate traction motors drivably connected to the wheels and electronic control means to provide separate trains of pulses to operate the motors conjointly for straight line motion and differentially for steering motion, means for recording the trains of pulses to the traction motors for recording the path followed by the machine and means for replaying the record to reproduce the trains of pulses which are fed to the motors whereby the machine will reproduce the original path followed by the machine: the improvement of a distance check device for comparing the distance run in operation with the distance run during replaying of the record to see if path discrepancies exist, and overrider control means responsive to the output of the distance check comparison to sense a lag or lead and correspondingly increase or decrease the power fed to the motors to effect speed correction that will correct the path discrepancy.

4,114,712

MOTOR VEHICLE WITH SPECIAL ARRANGEMENT OF FRONT WHEELS, FRONT DOOR, DRIVER'S CABIN AND ENGINE

László Finta, 1/D, Széchenyi utca, 1054 Budapest, Hungary

Filed Oct. 28, 1976, Ser. No. 736,303
Int. Cl.[2] B62D *31/02*
U.S. Cl. 180—21 **6 Claims**

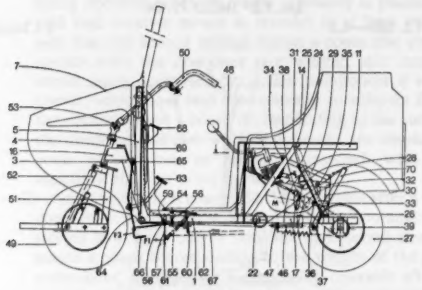


1. A motor vehicle having right and left front steered wheels, the axes of the right and left front steered wheels being spaced a substantial horizontal distance apart in a direction lengthwise of the vehicle, a driver's cabin in front of the left front wheel, a driving engine for the vehicle below the driver's cabin, and a passenger door on the right front side of the vehicle, the right front wheel and the passenger door being arranged one in front of the other.

4,114,713
MOTORIZED THREE WHEEL VEHICLE

Pierre Mery, 11 Impasse Gaston, Cugnec 34500-Beziers, France

Filed Dec. 17, 1976, Ser. No. 751,965
Claims priority, application France, Dec. 18, 1975, 75 38786
Int. Cl.[2] B62D *61/08;* B62K *5/06*
U.S. Cl. 180—27 4 Claims

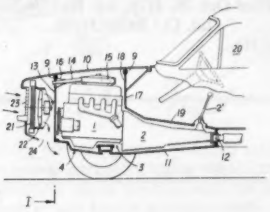


1. A relatively small articulated three wheeled vehicle comprising a chassis including a front frame and an articulated rear frame, a directing wheel mounted on said front frame, means for steering said directing wheel to control the direction of movement of the vehicle, a pivotal coupling connecting said rear frame to said front frame, shock absorbing means connecting a portion of said front frame to a portion of said rear frame in spaced relationship to said pivotal coupling, said rear frame including a pair of generally parallel, longitudinal side struts connected by a pair of generally parallel, transverse cross pieces, at least one drive wheel rotatably mounted on said movable frame, a power plant carriage slidably mounted on said rear frame, said carriage including a plurality of power plant support members, means for mounting a power plant on said support members, means drivingly connecting said power plant and said drive wheel, means for selectively moving said power plant carriage relative to said rear frame to adjust said driving connecting means, and clampable plates for securing said carriage in fixed adjusted position on said rear frame.

4,114,714
MOTOR VEHICLE HAVING SOUND-SUPPRESSING ENGINE ENCLOSURE

Heinz Fachbach; Gerhard Thien, and Josef Greier, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jun. 7, 1976, Ser. No. 693,517
Claims priority, application Austria, Jun. 13, 1975, 4553/75
Int. Cl.[2] B60P *4/09;* G10K *4/00*
U.S. Cl. 180—54 A 7 Claims

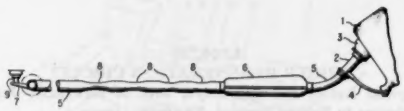


1. A motor vehicle comprising a water cooled internal combustion engine and a gearbox, said gearbox being connected to the engine to form an engine-gearbox unit, a fan-cooled water radiator, a chassis frame with two subframe beams, said engine-gearbox unit being supported on the two subframe beams via elastic bearing elements, a vehicle body connected to said chassis frame and having an engine compartment and a passenger compartment, two wheel arches forming lateral walls of the engine compartment and being connected to said subframe beams, an engine hood forming an upper wall of the engine compartment, a partition separating the engine compartment from the passenger compartment and forming a rear end wall of the engine compartment, a frontal end wall extending transversal relative to the longitudinal axis of the vehicle between the said two wheel arches, two upright lateral walls, each of them extending from one of the wheel arches upwards to the engine hood, said rear and frontal end walls being connected to said lateral walls, a bottom cover plate forming a bottom end wall of the engine compartment, said cover plate being connected to the subframe beams and the frontal end wall, said wheel arches, upright lateral walls, frontal and rear endwalls, and the bottom end wall forming together with the two subframe beams and the engine hood an all around fully closed soundproof encapsulation, the engine-gearbox unit being arranged within said encapsulation, said water radiator and its fan being located outside and in front of the said soundproof encapsulation.

4,114,715
PIPE, IN PARTICULAR AN EXHAUST PIPE FOR MOTOR VEHICLES

Didier Theron, Argenteuil, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 1, 1976, Ser. No. 691,481
Claims priority, application France, Jun. 3, 1975, 75 17236
Int. Cl.[2] B60K *13/04*
U.S. Cl. 180—64 A 3 Claims



1. In an exhaust system of an automotive vehicle, wherein an exhaust pipe is connected at one end to an engine of said vehicle which vibrates during operation and at its other end is flexibly supported by the frame of said vehicle, the improvement comprising:

means reinforcing the rigidity of the area of the connection of said exhaust to said engine; and

said exhaust pipe including an elongate axial portion of substantially circular section and having therein a series of localized indentations of said circular section, which are produced by flattenings of the circular section of the pipe into an elipsoidal section progressively connected to the circular section, providing a reduced moment of inertia in its center area, whereby the torsional stresses undergone by said exhaust pipe at its fixed extremity are, in a limited way, absorbed and distributed therein.

4,114,716
HOUSING APPARATUS

Julian V. Sanders, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 27, 1977, Ser. No. 810,549
Int. Cl.[2] B60K *11/04*
U.S. Cl. 180—68 R 7 Claims

1. An apparatus comprising:

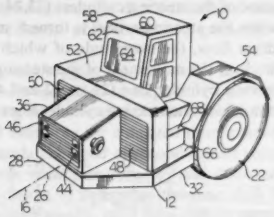
a frame having an axis, first and second generally parallel sides which are generally perpendicular to said axis and third and fourth generally parallel sides which are generally parallel to said axis and connected to said second side;

an engine housing having side portions and being connected to said frame and generally centered over said axis and positioned along said first side;

a unitary radiator housing connected to said frame adjacent said engine housing and being generally centered over

said axis and extending between the third and fourth sides to locations beyond said engine housing side portions;

a pair of wheel guards connected to said frame on opposed sides of said axis and spaced from said radiator housing, said radiator housing being positioned between said wheel



guards and said engine housing and connected to said second side; and

an operator compartment having top and side portions and being generally positioned between said wheel guards and said radiator housing and generally centered over said axis.

4,114,717

MOTOR VEHICLE OIL DRIP PAN APPARATUS DEVICE FOR AT LEAST INDIRECTLY SAVING LIVES AND ACCIDENTS ON A HIGHWAY

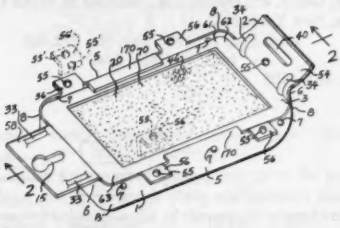
Peter Andrews, 190 Gebhardt Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 467,719, May 7, 1974, Pat. No. 3,980,153, which is a continuation-in-part of Ser. No. 315,174, Dec. 14, 1972, Pat. No. 3,809,175, which is a continuation-in-part of Ser. No. 94,793, Dec. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 532,831, Feb. 21, 1966, Pat. No. 3,669,204, and Ser. No. 750,094, Aug. 5, 1968, Pat. No. 3,590,937, said Ser. No. 750,094, is a continuation-in-part of Ser. No. 508,625, Oct. 21, 1965, Pat. No. 3,396,810, which is a division of Ser. No. 288,159, Jun. 17, 1963, abandoned. This application Sep. 13, 1976, Ser. No. 722,887

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.[2] B62D *25/20*

U.S. Cl. 180—69.1 **49 Claims**



1. A substantially skidpan single element apparatus device which is used in operative association with a first type of motor vehicle for retaining fluid drippings which drip from said motor vehicle having a front cross member having an integrally extending horn-like projection and a generally centrally located cross member comprising: a substantially skidpan fluid retaining and fluid impermeable receptacle having two outwardly formed integral side ear members with one of said side ear members generally extending at an angle from each of two upper substantially rectilinear side wall portions thereof and also having one integrally outwardly formed large bracket member having an opening and extending outwardly from one upper integral rectilinear end wall portion of said receptacle so that when said apparatus device is to be removably secured to said motor vehicle said side ear members are removably secured to said centrally located cross member by a removable securing means while said bracket member is hooked over and onto said horn-like projection by use of said opening in said bracket member for also suspendingly and hookingly disposing said receptacle under at least one portion of said vehicle and for receiving and substantially retaining fluid drippings which dripped substantially into said receptacle from at least one underpart portion of said vehicle; said receptacle having a bottom wall and two integral substantially rectilinear side wall portions and two integral substantially rectilinear end wall portions that merge integrally at four corner portions and having said side ear members and said bracket member extending integrally from said side wall portions and said end wall portion respectively.

4,114,718

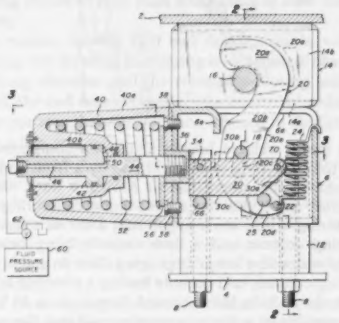
LOCKING HOOK AND PIN APPARATUS FOR LOCKING TOGETHER A PAIR OF COMPONENTS

Eugene C. Lipshield, Moberly, Mo., assignor to Orscheln Brake Lever Mfg. Company, Moberly, Mo.

Filed Jan. 17, 1977, Ser. No. 758,914

Int. Cl.[2] B62D *27/06*

U.S. Cl. 180—89.14 **16 Claims**



1. Apparatus for locking together a pair of components, such as the tilt cab chassis components of a motor vehicle, comprising

(a) a pin housing adapted for connection with one of said components;

(b) a hook housing adapted for connection with the other of said components, said pin and hook housings including adjacent parallel walls which are in abutting engagement when the components are positioned for connection, said pin housing containing a stationary transverse locking pin parallel with said housing walls, said hook housing containing a stationary pivot pin parallel with said locking pin;

(c) a hook member mounted for both axial and pivotal displacement on said pivot pin, said hook member including at one end a hook portion adapted for locking engagement with said locking pin, said hook member being axially displaceable from a normal locking position in which said hook portion is in engagement with said locking pin toward a safety position in which said hook portion is opposite and spaced from said locking pin, said hook member being pivotably displaceable from said safety position to a fully released position relative to said locking pin, thereby to permit separation of the components;

(d) means including first spring means connected between said hook member and said hook housing for pivotally biasing said hook member in the hook-locking direction relative to said locking pin;

(e) cam means including a cam member operable between locking, safety and releasing positions relative to said

hook housing for operating said hook member between its locked, safety and released positions, respectively;

(f) second spring means biasing said cam member toward the locking position; and

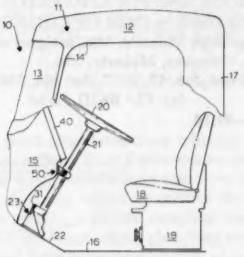
(g) linearly operable cam operating means for displacing said cam member from the locking position successively toward the safety and releasing positions against the biasing force of said second spring means.

4,114,719

DASH CONSOLE ACCESS ENABLING TILTING STEERING COLUMN

James Warren Saunders, Milpitas, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed Jan. 31, 1977, Ser. No. 764,084
Int. Cl.[2] B62D *1/18*
U.S. Cl. 180—90 **6 Claims**



1. In a motor vehicle having a driver's compartment enclosed in the front by a windshield and by a front wall below the windshield, said compartment having a floor and other wall structure and containing a floor-mounted steering column with a steering wheel at its upper end, a driver's seat behind said steering column and a dash console lying below said windshield and with a lower edge lying close to and in front of said steering column, said console having a plurality of indicators, controls, and the like mounted therein so as to be viewable and operable by a driver occupying said seat, the combination therewith of:

said bottom edge of said dash console being hinged to said front wall along a generally horizontal axis, said dash console thereby being rotatable along said axis from a closed upright operating position to an open access-enabling position, the amount of opening being limited by the console coming against said steering column or said steering wheel,

a pivot joint securing said steering wheel column pivotally to said floor, and

a readily openable locking clamp secured to said front wall below said console for securing said steering column in an upright operating position adjacent to said console,

whereby said clamp may be opened, and said column may then be tilted downwardly and rearwardly, relative to said console, thereby enabling said console to be moved to a backside-upward fully open generally horizontal access-enabling position.

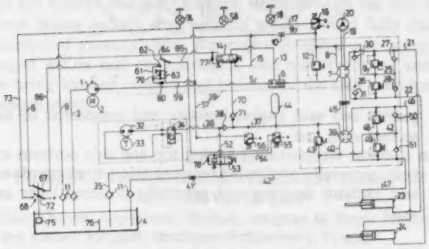
4,114,720

DUAL STEERING SYSTEM FOR VEHICLES

Hans Göran Ericson, and Bo Sanfrid Emanuel Steneriäs, both of Eskilstuna, Sweden, assignors to Volvo BM AB, Eskilstuna, Sweden

Filed Feb. 22, 1977, Ser. No. 770,748
Claims priority, application Sweden, Feb. 27, 1976, 7602701
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—133 **4 Claims**

1. In a hydraulic steering system for vehicles comprising two double-acting steering cylinders (23,24) and two steering circuits (1,5,7,21,22 and 32,37,38,46,47), each of which has a pressure medium pump (1;32) and a steering unit (7;39) which can be influenced by the steering wheel (20) of the vehicle, to each unit a supply line (5;37) carrying pressure medium from their respective pumps, each having a return flow line (8,9;40,42) and each having a pair of steering lines (21,22;47,46), each steering line of the pair of steering lines is connected to one of the steering cylinders (23,24), said steering unit (7;39), when the steering wheel is turned, metering out a pressure medium flow, the magnitude of which is dependent on the magnitude of the movement of the steering wheel, to its respective steering cylinder line (21 or 22 and 47 or 46); the improvement in which the steering cylinder lines (21,22) in one



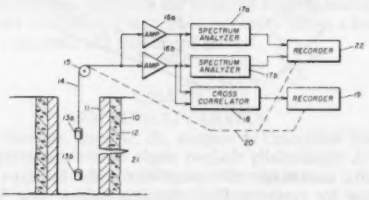
of the steering circuits (1,5,7) are connected to the rear cylinder spaces of the cylinders (23,24) while the steering cylinder lines (46,47) in the remaining steering circuit (32,37,39) are connected to the forward cylinder spaces of the cylinders (24,23), a pressure detecting means (56) for detecting pressure of the pressure medium and a coupling valve (14), which is also connected (13) to the first steering circuit (1,5,7) and arranged to be influenced by the pressure detecting means (56) when it detects pressure lying below a given minimum level so as to connect the steering circuits so that pressure medium is supplied to said remaining steering circuit from the first steering circuit, being connected to the supply line (37) of said remaining steering circuit (32,37,39).

4,114,721

METHOD AND SYSTEM FOR ACOUSTIC NOISE LOGGING

Edwin E. Glenn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,405
Int. Cl.[2] G01V *1/40*
U.S. Cl. 181—105 **4 Claims**



1. A method of logging a borehole for noise sources within a well, comprising the steps of:

(a) traversing the borehole with a logging tool having at least two axially spaced acoustic noise detectors for monitoring the acoustic noise within the borehole,

(b) recording a pair of first signals representative of both coherent and incoherent acoustic noise monitored by said detectors in correlation with depth to obtain a reconnaissance log,

(c) measuring the harmonic content of each of the signals from the acoustic detectors,

(d) determining the coherence of said measured harmonic contents as a function of depth of the logging tool within the borehole, coherence over some portion of the frequency spectrum indicating that the noise detected by the acoustic detectors at the depth associated with said coherence is coherent noise produced primarily by a casing leak,

(e) locating said logging tool at one or more depths within the borehole identified in step (d),

(f) monitoring the acoustic noise at said one or more depths with said detectors for a desired time interval,

(g) crosscorrelating a pair of second signals representative of the acoustic noise monitored by said detectors at said one or more depths to determine the time shift between said pair of second signals, each time shift so determined being representative of the time differential between the travel-time of coherent acoustic noise from a casing leak to said detectors, and

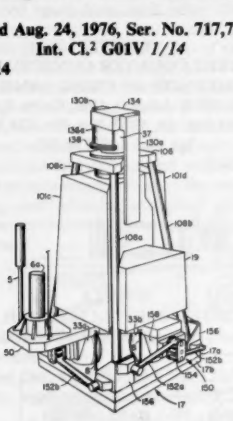
(h) identifying the location of said casing leak with respect to said detectors based upon the amount and direction of said time shift.

4,114,722

BROADBAND SEISMIC ENERGY SOURCE

Richard Martin Weber, and John William Bedenbender, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 24, 1976, Ser. No. 717,730
Int. Cl.[2] G01V *1/14*
U.S. Cl. 181—114 **11 Claims**



5. A seismic energy source transported by a vehicle and comprising:

(a) a baseplate for coupling seismic energy to the ground,

(b) at least one hold-down plate and support means for applying at least a portion of the weight of said vehicle to said hold-down plate,

(c) means for coupling substantially vertical forces from said hold-down plate to said baseplate, and

(d) stabilizing means for limiting translation of said hold-down plate relative to said baseplate, said stabilizing means further comprising:

(i) a center link pivotally coupled to said baseplate,

(ii) a first stabilizing rod rotatably coupled at one end to a point on said center link above the level of its pivot and at the other end to a first point of said hold-down plate, and

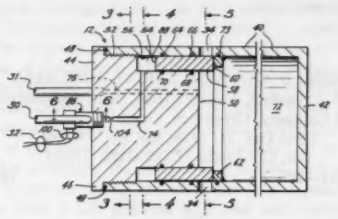
(iii) a second stabilizing rod rotatably coupled at one end to a point on said center link below the level of its pivot and at the other end to a second point of said hold-down plate.

4,114,723

PNEUMATIC SEISMIC SIGNAL GENERATOR WITH INDEPENDENT FIRING CONTROL PRESSURE

John Lloyd Paitson, Galveston, and Marion Lonnie Parker, Houston, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed Dec. 10, 1976, Ser. No. 749,548
Int. Cl.[2] G01V *1/38*
U.S. Cl. 181—120 **5 Claims**



1. An air gun for generating a seismic acoustic pulse in a body of water comprising:

a casing closed at both ends and having at least one exhaust port;

valve means, having two end faces, slidable within said casing, for dividing said casing into a control chamber and a firing chamber and for releasably closing said exhaust port, the end face exposed to the control chamber having a larger area than the end face exposed to the firing chamber when said valve is closed;

means for sealing the control chamber from fluid communication with the firing chamber;

means for supplying control air under a first relatively low pressure to said control chamber to cause said valve means to close said exhaust port, and separate means for supplying air under a second higher pressure to said firing chamber;

means for dumping a metered volume of the air from said control chamber to allow said valve means to open said exhaust port thereby to allow the air in said firing chamber to escape impulsively into the water; and

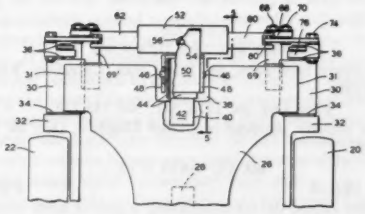
controllably resilient means in said control chamber for absorbing the momentum of said valve means.

4,114,724

STEERING MECHANISM

Mac R. Doolittle, Charlotte, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 707,961, Jul. 23, 1976, Pat. No. 4,064,967.
This application May 25, 1977, Ser. No. 800,265
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—155 **10 Claims**



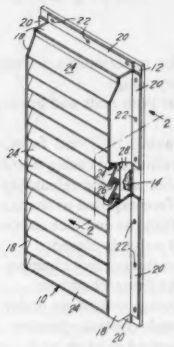
1. A steering mechanism for wheeled vehicles having right and left steer wheels comprising a transverse steer axle, a generally inverted U-shaped steering assembly surrounding

said steer axle and connected to the steer wheels on opposite sides thereof, said steering assembly including steering arm and king post means operatively connected to each steer wheel at each side of the steer axle and tie rod means operatively connected at each opposite end to a said steering arm and king post means, said tie rod means including an hydraulic actuator, said steer axle being supported from said king post means, said tie rod means extending above said steer axle and operatively connected to said steer axle with said actuator being mounted for pivotal movements about a vertical axis and about a transverse horizontal axis.

4,114,725
SHIELD AND ACOUSTICAL ASSEMBLY

William H. Croasdale, Morris Plains, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 21, 1976, Ser. No. 734,665
Int. Cl.[2] E04H *17/00*; G10K *11/00*
U.S. Cl. 181—205 **16 Claims**



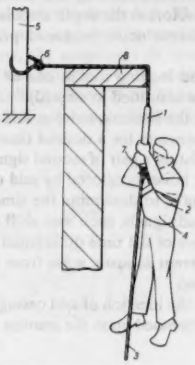
1. A shield for an assembly, comprised of a member of generally corrugated construction adapted for mounting in a generally vertical position, each corrugation of said member consisting of a forward element and a rearward element joined at a common forward edge, adjacent corrugations of said member being joined at common rearward edges, with said common rearward edges of said corrugations being disposed on a common plane, said forward elements being substantially imperforate, and said rearward elements thereof having perforations formed therein to permit sound waves to pass there-through to the rearward side of said shield, said rearward element of each corrugation forming an obtuse included angle with said common plane, to dispose said rearward element of said corrugation therebehind, thereby screening said rearward element from contact by matter impinging upon said shield in a direction generally normal to said plane, and preventing liquid, descending over said shield, in the normal generally vertical position thereof, from entering said perforations.

4,114,726
FIRE ESCAPE DEVICES

Victor Edward Sentinella, 68, Dome Hill, Caterham, England (CR36EB)

Filed Oct. 26, 1976, Ser. No. 735,779
Claims priority, application United Kingdom, Oct. 29, 1975, 44545/75
Int. Cl.[2] A62B *1/16*
U.S. Cl. 182—5 **4 Claims**

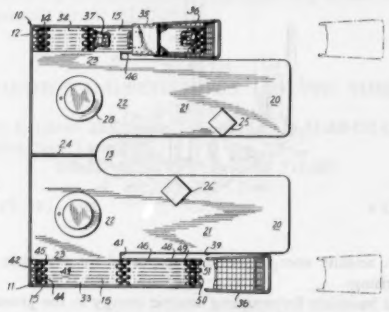
1. A fire escape device comprising a pair of arms mounted for movement between an open position and a closed position, a first means on one arm defining at least a part of a passage, a second means on the other arm defining at least a part of a passage, and fastener means for fastening the arms together in the closed position, the first means cooperating with the second means, when the arms are in the closed position, to define a tortuous passage for an elongate body, for example a cable, the tortuosity of the passage being such that movement of an elongate body, for example a cable, along the passage is retarded, said arms being pivotally connected together at respective ends, said fastener means comprising distal end portions of said arms, one end portion being formed with a hole for receiving a fastener, and one end portion being formed with a slot for allowing limited pivotal movement of the arms in the closed portion.



4,114,727
SUPERMARKET COUNTER CONSTRUCTION AND METHOD OF USING SAME

Stanley Joseloff, 185 S. Atlantic Ave., Cocoa Beach, Fla. 32931

Filed Sep. 23, 1977, Ser. No. 836,031
Int. Cl.[2] A47F *10/00*
U.S. Cl. 186—1 AC **6 Claims**

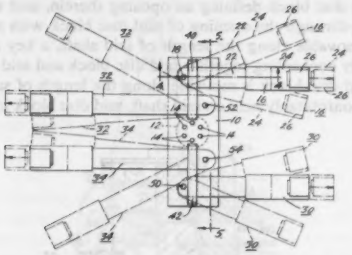


1. Check-out counter construction comprising: first and second generally elongated counters disposed in parallel relation, each of said counters having an upstream end and a checking area including a tallying device in mutually spaced relation to define an elongated bay therebetween for accommodating a single person between said checking areas; said counters each including juxtaposed downstream areas for the temporary storage of tallied articles, and a bag loading area including a conveyor element having an axis of movement substantially parallel to the principal axis of said counter element; said loading areas each including extensions forming a loading dock accommodating one end of a shopping cart, said dock including camming means for moving a pivotally mounted wall on said shopping cart from vertical to substantially horizontal position to define an opening in said shopping cart through which loaded bags may pass.

4,114,728
VEHICLE-LIFT SUPERSTRUCTURE

John Alexander Jones, 6312 Fairfield Dr., Flourtown, Pa. 19031

Filed Sep. 6, 1977, Ser. No. 829,635
Int. Cl.[2] B66F 7/28
U.S. Cl. 187—8.75 5 Claims



1. In a vehicle-lift superstructure comprising a bolster mountable on a lift piston and a plurality of horizontally-pivotable swing arms mounted on the top side of said bolster and extending therefrom for supporting a vehicle, the improvement wherein

a first and a second of said arms extend outward from one side edge of said bolster and are pivotable horizontally about respective first and second vertical axes, which axes:

(a) are spaced apart from each other along a predetermined dimension of said bolster, and

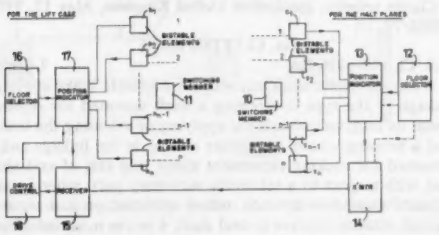
(b) pass through that half of said top of said bolster more remote from said one side edge; and

at least another of said arms extends outward from the opposite side edge of said bolster and is pivotable about a third vertical axis extending through that half of said top of said bolster more remote from said opposite side edge and intermediate said first and second axes along a direction parallel to said dimension, whereby the end portion of said third swing arm adjacent said third axis is positioned between the corresponding end portions of said first and second arms.

4,114,729
HALT SELECTOR SYSTEM

Ulf Köhler, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Oct. 18, 1976, Ser. No. 733,582
Claims priority, application Sweden, Oct. 17, 1975, 7511669
Int. Cl.[2] B66B 1/40
U.S. Cl. 187—29 R 6 Claims

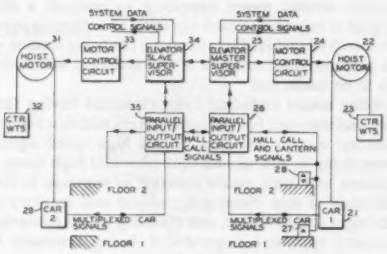


1. A halt selector system for a vehicle movable along a defined path, comprising at least one switching circuit positioned remotely from the drive machinery of the vehicle for selecting a halt position for said vehicle, said switching circuit including means operative to sense the position of the vehicle with respect to a selected halt position and, in response to the position of the vehicle with respect to said selected halt position, to control a transmitter to emit first and second different frequency signals to a receiver which is positioned adjacent the drive machinery of the vehicle and which is connected to an operating unit for said drive machinery, said first signal being operative to effect activation of a control circuit in said operating unit to indicate that the vehicle is to be driven in one direction, and said second signal being operative to effect activation of said control circuit in said operating unit to indicate that the vehicle is to be driven in the opposite direction, said transmitter also being operative to emit to said receiver a third signal, distinguishable from each of said first and second signals, for deactivating said control circuit to cause said vehicle to be stopped at the nearest halt position in the travel direction of the vehicle, said switching circuit including, for each halt position, at least one bistable unit which is adapted to assume one state when the vehicle is located at one side of the halt position and to assume its other state when the vehicle is located at the other side of said halt position, a switch-over device for switching the state of said bistable unit when said vehicle is moving along said path and is at a predetermined distance from a halt position such that said vehicle can be stopped at said halt position, and control means responsive to the state of said bistable unit for activating the transmitter to emit said first signal if the vehicle is located at one side of the halt position or to emit said second signal if the vehicle is located at the other side of the halt position, said control means being operative, when the vehicle has arrived at a halt position at which it is to stop, to activate the transmitter to emit said third signal in response to the switching of the state of said bistable unit.

4,114,730
TRANSPORTATION SYSTEM WITH INDIVIDUAL PROGRAMMABLE VEHICLE PROCESSORS

David K. Means, Palo Alto, Calif., and Clyde A. Boenke, Ann Arbor, Mich., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 7, 1976, Ser. No. 721,062
Int. Cl.[2] B66B 1/18
U.S. Cl. 187—29 R 53 Claims



1. In an elevator system including an elevator car movable along an elevator hatchway for serving at least two floors having landings, control means for controlling the elevator car in response to control signals, a source of data signals characteristic of service conditions for the system and an elevator supervisor responsive to the service condition signals for generating the control signals, the elevator supervisor comprising:

a bus means having a plurality of signal transmission lines;

at least one supervisor interface circuit connecting the service condition signals source and the control means to said bus means signal transmission lines; and

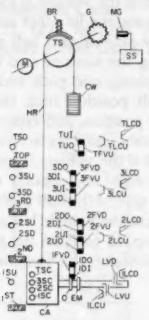
a processing means connected to said bus means signal transmission lines for reading the service condition signals and for generating the control signals in response thereto through said supervisor interface circuit and said bus means wherein said one supervisor interface circuit is a position-velocity circuit and the service condition signals

source includes a source of car position signals and car velocity signals connected to said position-velocity circuit whereby said processing means reads said car position signals and said car velocity signals through said position-velocity circuit and said bus means.

4,114,731
ELEVATOR SAFETY ARRANGEMENT

John Joseph Faup, Oradell, and David Harvey Wolf, Ringwood, both of N.J., assignors to Otis Elevator Company, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,021
Int. Cl.[2] B66B 5/02
U.S. Cl. 187—29 R **5 Claims**



1. In an elevator system having control apparatus by which an elevator car is moved automatically between a plurality of landings and is stopped automatically at any one of said plurality of landings upon initiation of a stopping operation for each respective landing, a safety arrangement comprising:

velocity sensing means producing at least a low and high speed signal in response to the speed of the car being less than or in excess of a predetermined velocity, respectively;

distance sensing means operating to produce a distance signal in response to each initiation of a stopping operation for each of said landings upon the car being located within a predetermined distance of the landing at which the stop is to be made; and

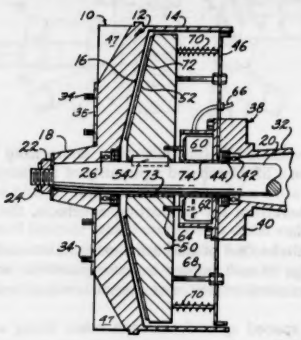
disabling means including memory means having first and second state and being operable from said first state to said second state in response to said high speed signal, and remaining in said second state after said high speed signal ceases, and logic means actuated in response to the production of said distance signal and said memory means being in said first state, said disabling means rendering said control apparatus inoperable if during automatic movement between landings said velocity sensing means does not produce a high speed signal.

4,114,732
DISC BRAKE

Robert C. Dunn, 8477 Dorris Rd., Douglasville, Ga. 30134

Continuation of Ser. No. 639,453, Dec. 10, 1976, abandoned.
This application Jul. 5, 1977, Ser. No. 812,529
Int. Cl.[2] F16D 55/10, 65/09
U.S. Cl. 188—73.2 **4 Claims**

1. In a brake assembly for a vehicle or the like comprising a nonrotatable shaft and a hub defining a central opening therein and internal bearing means in said opening, said hub being rotatably mounted on said shaft with said bearing means engaging said shaft, said hub including a plurality of lug studs extending in a circular arrangement about said opening from the outer face thereof for mounting a wheel thereon, and a concave conical surface formed in said hub on the back face thereof opposite to said lug studs, said concave conical surface having its central axis aligned with the axis of said shaft and extending from immediately adjacent said bearing means and said opening from a radius substantially smaller than the radius of the circular arrangement of said lug studs radially outwardly to the peripheral portion of said hub to a radius substantially greater than the radius of the circular arrangement of said lug studs, a disc block defining an opening therein, said shaft extending through the opening of said disc block with said disc block movable along the length of said shaft, a key and slot assembly connecting together said disc block and said shaft so that said disc block is movable along the length of said shaft and is nonrotatably held on said shaft, said disc block including



a convex conical surface having its central axis aligned with the axis of said shaft and being of a size and shape corresponding to the size and shape of the concave conical surface of said hub so that the convex conical surface of said disc block is movable with said disc block along said shaft toward and away from the concave conical surface of said hub into engagement with substantially the entire concave conical surface of said hub, an annular hydraulic cylinder extending about said shaft and including means extending therefrom at positions closely adjacent said shaft and inwardly of the convex conical surface of said disc block for urging said disc block toward engagement with said hub, and spring means positioned adjacent the peripheral portions of said disc block and said hub for urging said disc block away from said hub.

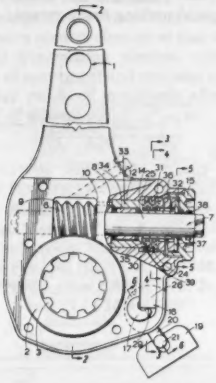
4,114,733
AUTOMATIC SLACK ADJUSTERS FOR VEHICLE BRAKE LINKAGES

Peter Charles Knight, Edgbaston, England, assignor to Girling Limited, Birmingham, England

Filed Jul. 11, 1977, Ser. No. 814,725
Claims priority, application United Kingdom, May 12, 1977, 19932/77
Int. Cl.[2] F16D 65/56
U.S. Cl. 188—196 BA **2 Claims**

1. An automatic slack adjuster for a vehicle brake applying linkage of the type comprising a shaft mounted for rotation about its longitudinal axis for applying or releasing the brake, and a housing which constitutes a lever in the linkage and is mounted for rocking movement about said axis of said shaft and with respect to a relatively stationary part, wherein said adjuster comprises a worm wheel mounted on and secured against rotation relative to said shaft, a worm mounted in said housing and meshing with said worm wheel to transmit angular movement of said lever to said shaft, and automatic worm driving means for rotating said worm with respect to said housing to compensate for slack in said linkage in response to relative movement between said lever and said relatively stationary part, said automatic worm driving means incorporating a connection having a degree of lost-motion equivalent to a desired braking clearance, said connection including a clutch

of the multi-plate type comprising a plurality of primary clutch plates coupled to said worm a plurality of secondary clutch plates interposed alternately between said primary clutch plates and resilient means for urging said second clutch plates normally into driving engagement with said first clutch plates, and a linearly slidable pawl acting between said second clutch plates and said stationary part to effect rotation of said second-



ary clutch plates after relative movement between said lever and said stationary part has exceeded a value equivalent to said degree of lost-motion, each secondary plate being provided with a tooth, and said pawl being provided with a notch in which all said teeth are received, said notch being of greater length than the circumferential length of said tooth to define said lost-motion.

4,114,734

RETARDER FOR VEHICLES, ESPECIALLY HEAVY TRUCKS

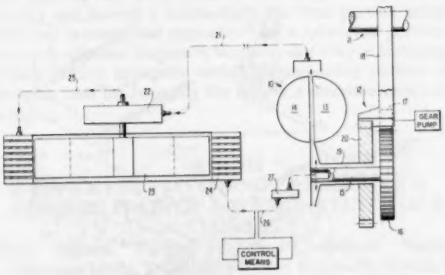
Friedrich Bultmann, Winnenden, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 24, 1973, Ser. No. 326,564

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1972, 2203319

Int. Cl.² F16D *57/04*

U.S. Cl. 188—274 **14 Claims**



1. A continuous brake system for vehicles comprising, in combination,

a hydrodynamic coupling means for providing braking forces to a vehicle, said hydrodynamic coupling means operating to provide said braking forces exclusively by action of a fluid coupling,

an annular cooler means for providing a large cooling surface area,

a radial fan means for providing cooling air to said annular cooler means, said annular cooler means being arranged circumferentially about said radial fan means, such that said annular cooler means and said radial fan means are provided in a relatively flat structure,

radial turbine means for driving said radial fan means, and

circulatory means for circulating operating fluid from said hydrodynamic coupling means to said radial turbine means through said annular cooler means and back to said hydrodynamic coupling means, wherein said hydrodynamic coupling means pumps said operating fluid through said circulatory means, thereby cooling said operating fluid in a separate system

characterized in that the hydrodynamic coupling means includes two rotors driven in opposite directions of rotation, wherein the two rotors of the hydrodynamic coupling means are driven at speeds whose absolute rotational speeds are at least approximately identical, and wherein the two rotors of the hydrodynamic coupling means are operatively connected with intermediate gear means of approximately identical diameter, of which one intermediate gear means engages directly with a gear wheel connected with a driving shaft while the other intermediate gear means engages with the gear wheel connected with the driving shaft by way of a reversing gear,

characterized in that said gear wheel is of double width, and in that the reversing gear serves in its turn, for the drive of a pump for lubricating purposes or the like,

characterized in that the hydrodynamic coupling means serving as a retarder together with its drive is combined into a structural unit within a common housing means, and

characterized in that the gear wheel operatively connected with the driving shaft is extended with its hub as far as possible into the plane of the hydrodynamic coupling means and its wheel body is constructed conically and carries at its outer circumference toothed means of a ring gear.

4,114,735

HYDRAULIC DAMPER AND VALVE STRUCTURE

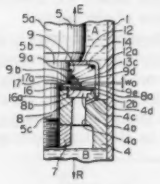
Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Mar. 7, 1977, Ser. No. 775,644

Claims priority, application Japan, Mar. 15, 1976, 51-27979; Apr. 20, 1976, 51-49580[U]

Int. Cl.² F16F *9/348*

U.S. Cl. 188—282 **7 Claims**



1. A hydraulic damper having an oil chamber partitioning member such as a piston or a bottom member or the like and having a passage therein connecting two oil chambers partitioned by said partitioning member, and a damping force generating device disposed in said partitioning member, said damping force generating device comprising a flexible valve disc means adapted to open or close said passage for generating a damping force against the oil flowing across the device in opposite directions, a fixed outer periphery supporting valve seat on said partitioning member for engaging with the outer periphery of said valve disc means on one face of said valve disc means, a fixed inner periphery supporting valve seat on said partitioning member for engaging with the inner periphery of the valve disc means on the other face of said valve disc means, and a movable spring loaded valve seat sealingly engaged between said other face of said valve disc means around the entire periphery thereof and said partitioning member for

restricting the effective pressure receiving area of said valve disc means and movably mounted on said partitioning member for limited movement in the direction of movement of said valve disc means while remaining in sealing engagement with said valve disc means when the valve disc means deflects in one direction under the spring loading thereof for delaying the opening of said passage and movable with the valve disc means against the spring loading thereof when the valve disc means deflects in the other direction.

4,114,736

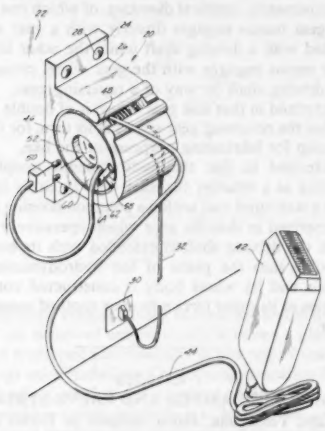
CORD RETRACTOR FOR RETRACTING CORD OF ELECTRICAL APPLIANCES

Volker Scherenberg, 11 Meadow La., Saddle River, N.J. 07458

Filed Jul. 5, 1977, Ser. No. 812,507

Int. Cl.[2] H02G *11/02*

U.S. Cl. 191—12.4 **15 Claims**



13. A cord retractor for retracting a cord of an electrical appliance comprising:

a housing adapted to be mounted to a supporting structure;

a drum rotatably mounted in the housing;

electrical connection means for connecting the cord retractor to a source of electricity;

access means on the housing and drum to introduce a cord of an electrical appliance into the housing to be reeled onto the drum and connected to the electrical connection means to supply electricity to the appliance; and

electrical connection means for connecting the cord retractor to the cord of an electrical appliance.

4,114,737

DRIVE CONTROLLING MECHANISM

Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Dec. 14, 1976, Ser. No. 750,537

Claims priority, application Japan, Dec. 18, 1975, 50-171224[U]

Int. Cl.[2] B60T *17/04;* B60K *3/02;* F01B *13/06*

U.S. Cl. 192—3 N **3 Claims**

1. A drive controlling mechanism comprising in combination:

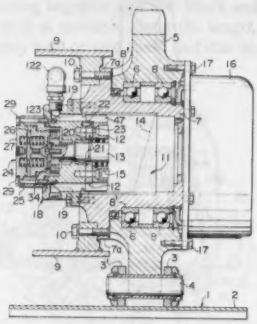
an hydraulic motor including a cylinder block and a rotary shaft extending axially of and positioned within said cylinder block to be engaged with said cylinder block for rotation therewith,

a motor housing for accommodating therein said hydraulic motor,

a control block securely connected with said motor housing and rotatably receiving one end portion of said rotary shaft, said control block having an axially outer end face and an outer peripheral face,

a parking brake means detachably received within the axially outer half of said control block for braking said rotary shaft,

a parking brake inlet-outlet conduit formed in said control block for introducing and discharging fluid under pressure to and from said parking brake means for actuating and de-actuating said parking brake means,



a control valve means detachably mounted on the outer peripheral face of said control block in fluid communication with said parking brake means through a radial bore formed in said control block, said radial bore being in fluid communication with said parking brake inlet-outlet conduit, so that the running of said hydraulic motor will be controlled by said control valve means, and

a pair of inlet-outlet conduits for introducing and discharging said pressure fluid to and from said control valve means.

4,114,738

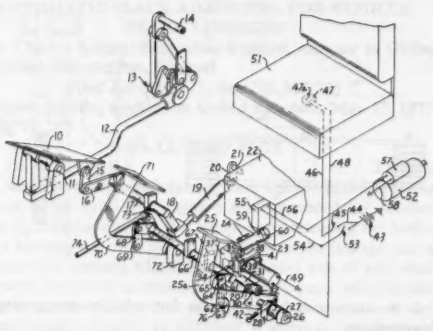
BRAKE AND CREEPER CONTROL SYSTEM

Vaikai K. Brown, Thompson, and Richard N. Fatur, Eastlake, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 17, 1977, Ser. No. 760,065

Int. Cl.[2] B60K *41/24*

U.S. Cl. 192—4 A **10 Claims**



1. A combined brake and transmission override control system comprising:

brake actuating linkage;

a first pedal mounted for pivotal movement about a first axis;

a second pedal mounted for pivotal movement about a second axis;

lost motion linkage means for connecting said second pedal

to said brake actuating linkage for operation of said brake linkage after a predetermined range of movement of said second pedal, said lost motion linkage means comprising a rotatable shaft mounted for pivotal movement on a third axis, said third axis being radially offset from said first and second axes, said shaft extending between said first and second pedals; and

a transmission control element; and,

transmission linkage means connecting said second pedal to said transmission control element so that said second pedal operates said transmission element over said predetermined range of movement and operates said brake linkage over a further range of movement after said predetermined range of movement.

4,114,739

SPRING FOR FREE-WHEELING DEVICE

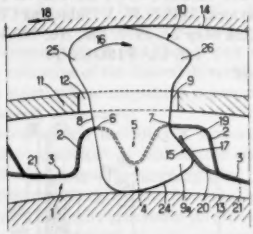
Jérôme Colonna, Bobigny; Jean-Michel Monville, Paris, and Francois Munoz, Marseille, all of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Feb. 14, 1977, Ser. No. 768,564

Claims priority, application France, Feb. 24, 1976, 76 05070

Int. Cl.[2] F16D *41/07*

U.S. Cl. 192—41 A **13 Claims**



1. A spring structure for a free-wheeling device comprising a formed and cut out metallic strip having means defining a series of principal undulations separated by substantially cylindrical portions, each of said principal undulations having near its outer summit portion a window for receiving a wedging cam and which is gripped between opposite edges of said window, and a secondary undulation in the material of the strip on each side of the window for improving the elasticity of the cam gripping, means defining a series of cam swinging tongues, one adjacent each such window, each tongue being bent outwardly and having a substantially flat base portion integral with and in substantial alignment with a cylindrical portion of said strip adjacent each such window, said tongue including a central portion engagable with a corresponding portion of a wedging cam for swinging the cam in a direction improving wedging.

4,114,740

DEVICE FOR PREVENTING VIBRATION OF A PRESSURE PLATE OF A FRICTION CLUTCH OF A VEHICLE

Teruo Sugiura, Toyota; Hiromitsu Tsubouchi, Nagoya; Nobuyasu Ishida, Tokai, and Kiyonori Kobayashi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Apr. 22, 1977, Ser. No. 789,926

Claims priority, application Japan, Apr. 23, 1976, 51/46998

Int. Cl.[2] F16D *13/56*

U.S. Cl. 192—70.18 **7 Claims**

1. A friction clutch for transmitting torque from a crankshaft to an input shaft of a transmission, which comprises:

a flywheel connected to said crankshaft;

a rotatable entrainer disc, adjacent to and operatively associated with said flywheel for transmitting torque from said flywheel to said input shaft;

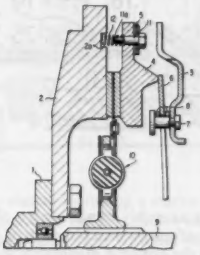
a cover attached to said flywheel;

a pressure plate disposed between said entrainer disc and said cover;

means for securing said pressure plate to said cover whereby said pressure plate is axially displaceable with respect to said cover;

a clutch plate spring attached to said cover for axially displacing said pressure plate to engage said entrainer disc during said torque transmission; and;

means for dampening vibration of said pressure plate upon



disengagement from said entrainer disc, positioned between said flywheel and said pressure plate, and operatively secured to said securing means wherein said securing means comprises a connecting member with first and second end portions extending from a side of said pressure plate adjacent said flywheel and from a side of said pressure plate adjacent said cover, respectively,

at least one resilient member interconnecting said second connecting member end portion and said cover, and

wherein said vibration dampening means is connected to said first connecting member end portion.

4,114,741

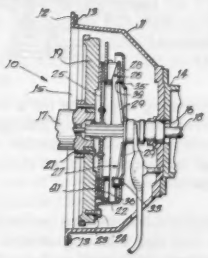
FABRICATED PRESSURE PLATE

Terry Kent Lindquist, Troy, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,383

Int. Cl.[2] F16D *13/70, 13/72*

U.S. Cl. 192—89 B **24 Claims**



1. A fabricated clutch pressure plate comprising an annular generally U-shaped member having inner and outer peripheral flanges joined by a base portion and at least one stiffening member secured within the flanges to provide a discontinuous fulcrum surface.

4,114,742

FRICTION CLUTCH COVER ASSEMBLIES

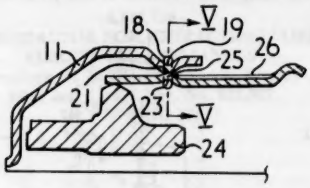
Dennis George Rawlings, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Feb. 15, 1977, Ser. No. 768,769

Claims priority, application United Kingdom, Feb. 17, 1976, 06087/76

Int. Cl.[2] F16D *13/54*

U.S. Cl. 192—89 B 6 Claims



1. A clutch cover assembly comprising a clutch cover of a generally annular configuration; a plurality of holes circumferentially arranged in the cover; a diaphragm spring attached to the cover and having an annular frusto-conical portion and a plurality of inwardly spaced projecting spring fingers integral therewith; a pressure plate secured to the cover so that the diaphragm spring is interposed between the pressure plate and the cover; a pluraity of individual wire members each of which consists of a length of wire formed into a substantially closed rectangular ring and passes through adjacent holes in the cover so as to tightly embrace and axially clamp together one finger of the diaphragm spring and a portion of the cover between said adjacent holes and a portion of said ring lies against the side of the finger away from the cover so as to provide a fulcrum for the movement of the finger relative to the cover.

4,114,743

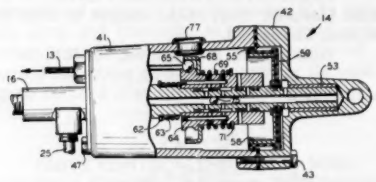
FLUID ACTUATED OPERATOR AND CLUTCH LINKAGE

William H. Sink, Auburn, and Russel L. Mitchener, Pleasant Lake, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed May 3, 1976, Ser. No. 682,364

Int. Cl.[2] F16D *25/00*

U.S. Cl. 192—91 R 9 Claims



1. In a clutch operating apparatus for a vehicle having a clutch connected to a clutch operating linkage, a clutch pedal connected to a clutch pedal linkage, a source of pressure fluid, and a fluid actuated operator connected thereto, wherein the fluid actuated operator comprises:

a housing;

a sleeve internal of said housing and connected to the clutch pedal linkage, said sleeve having an axial bore and a first fluid passage means with both ends axially spaced apart and in fluid communication with said axial bore;

an operator rod having one end connected to the clutch operating linkage and the other end extending through the wall of said housing and the axial bore of said sleeve, said operator rod having a first fluid passage having one end communicating with the source of pressure fluid and the other end in communication with the exterior of said operator rod internal of said housing, and a second fluid passage having one end communicating with the exterior of said operator rod and axially spaced from the other end of said first fluid passage of said operator rod internal of said housing and the other end in communication with the exterior of said operator rod internal of said housing; and

means responsive to pressure fluid for moving said operator rod in an axial direction, said pressure fluid responsive means internal of said housing and attached to said operator rod and to said housing to form a first cavity in fluid communication with the other end of said second fluid passage of said operator rod whereby actuation of the clutch pedal in a first direction moves said sleeve to position each end of the first fluid passage of said sleeve in registry with a corresponding one of the axially spaced ends of said first and second fluid passages in fluid communications with the exterior of said operator rod to connect the source of pressure fluid to said first cavity.

4,114,744

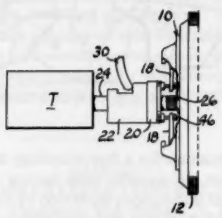
CLUTCH THROW-OUT BEARING PLATE

Tommey J. Blaylock, 2448 N.W. 3, Oklahoma City, Okla. 73107

Filed May 23, 1977, Ser. No. 799,448

Int. Cl.[2] F16D *23/14*

U.S. Cl. 192—98 1 Claim



1. In a vehicle clutch assembly having a flywheel and a clutch pressure plate movable toward and away from the flywheel by a plurality of radially inwardly projecting clutch release fingers, a transmission input shaft connecting the clutch pressure plate with a transmission and having a clutch throw-out bearing coaxially mounted on the shaft and movable toward and away from the inwardly directed end portions of said clutch release fingers, the improvement comprising:

a bearing plate comprising a flat ring-like plate coaxially surrounding said transmission input shaft and interposed between said throw-out bearing and the inwardly directed end portions of said clutch release fingers; and,

a plurality of connector means connecting said bearing plate means with said fingers permitting limited movement of said clutch release fingers in a radial direction with respect to said bearing plate when said throw-out bearing plate and said clutch release fingers are moved toward and away from said clutch pressure plate,

each said connector means comprising a stud bolt having its shank threadedly engaged with the respective said finger and having a head portion disposed adjacent said bearing plate, and,

a generally cylindrical housing loosely surrounding said stud bolt head portion and connected with one face surface of said ring-like plate,

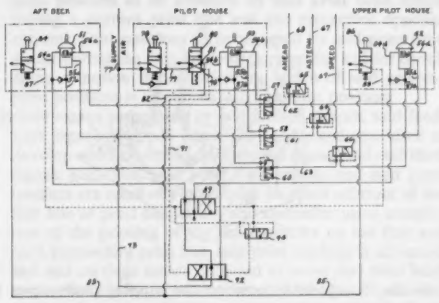
said housing having a slot transversely surrounding said stud bolt shank adjacent said stud bolt head portion with the longitudinal axis of the slot extending in a radial direction with respect to said bearing plate.

4,114,745

MARINE PROPULSION CONTROL TRANSFER SYSTEM

John M. Phinney, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Mar. 18, 1977, Ser. No. 779,024
Int. Cl.[2] B60K *41/00*
U.S. Cl. 192—0.098 4 Claims



1. A control transfer system for a pneumatic marine propulsion control supplied by a source of air under pressure and responsive to pressure signals including a pair of alternative pressure signals indicative of the desired direction of travel and a third pressure signal whose magnitude is proportional to the desired engine speed, comprising:

a master control station including a manually actuatable throttle valve connected to said source and adapted to provide a first set of said pressure signals;

a secondary control station remote from said master station and including a manually actuatable throttle valve capable of providing a second set of said pressure signals after connection to said source;

a transfer valve at said master station for connecting said source to said secondary station;

a tertiary control station remote from said master station and said secondary station, said tertiary station including a manually actuatable throttle valve capable of providing a third set of said pressure signals after connection to said source;

a pilot operated selector valve connected to receive air under pressure from said source and to alternatively connect such air under pressure to the throttle valves of said secondary and tertiary stations;

a manually actuatable attendance valve at said tertiary station adapted when actuated to pilot said selector valve to connect air under pressure from said source to said tertiary station throttle valve;

manually actuatable transfer and attendance valves at said secondary station, said secondary station attendance valve adapted when actuated to connect said source to said secondary station transfer valve, said secondary station transfer valve being adapted to pilot said selector valve to connect air under pressure to said secondary station throttle valve and alternatively to connect said source to said tertiary station attendance valve;

a first bank of shuttle valves each connected to receive one of said pressure signals of said first set and a corresponding one of said pressure signals of another set and to connect to said control the respective signals which are at the higher pressure; and

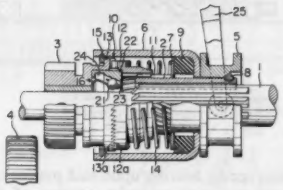
a second bank of shuttle valves each connected to receive one of said pressure signals of said second set and a corresponding one of said pressure signals of said third set and to connect to said first bank of shuttle valves the respective signals which are at the higher pressure.

4,114,746

OVERRUNNING CLUTCH DEVICE FOR ENGINE STARTING UNIT

Kazuhisa Usui, Fukaya, and Osamu Muto, Nitta, both of Japan, assignors to Sawafuji Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1977, Ser. No. 783,442
Claims priority, application Japan, May 18, 1976, 51-56126
Int. Cl.[2] F16D *23/10*
U.S. Cl. 192—104 R 4 Claims



1. In an engine starter including a starter motor and a drive pinion slidably mounted on the output shaft of said starter motor for meshing engagement with the ring gear of the associated engine, an overrunning clutch device comprising:

a one-way clutch including a driven clutch member associated integrally with the drive pinion, a driving clutch member slidably mounted on the output shaft of the starter motor for driving engagement with said driven clutch member and disengagement therefrom, and a clutch spring arranged normally to urge said driving clutch member into driving engagement with said driven clutch member;

an annular weight retainer formed around the outer periphery thereof with a plurality of radially flexible resilient arms and secured to said driven clutch member coaxially therewith;

a plurality of spherical-shaped centrifugal weights each rotatably mounted on the respective one of said resilient arms of said weight retainer; and

a thrust ring connected with said driving clutch member and held in sliding engagement with said centrifugal weights so as to force said driving clutch member out of driving engagement with said driven clutch member against the urge of said clutch spring under the thrust of said centrifugal weights when the latter are subjected to a centrifugal force of a magnitude exceeding a predetermined value.

4,114,747

SWITCHING BEARING ASSEMBLY FOR A MOTOR-DRIVEN SPINDLE

Fritz Eller, Hellweg 36, 4300 Essen 14, Germany

Filed Mar. 17, 1977, Ser. No. 778,462
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611211
Int. Cl.[2] F16D *71/00, 63/00*
U.S. Cl. 192—150 9 Claims

1. A switch-bearing assembly for a motor-driven spindle having a screw operatively connected to a driven member for axially displacing same upon rotation of the screw, said assembly comprising a bearing housing surrounding said spindle and provided with a pair of shoulder ball bearings axially engaging said spindle in opposite directions;

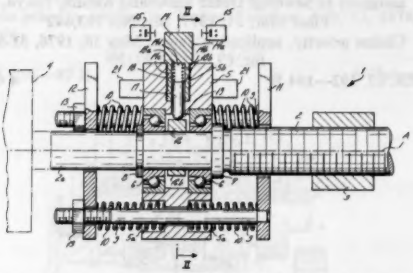
a pair of axially fixed pressure plates flanking said housing and spaced therefrom;

respective guide rods bridging said pressure plates;

respective compression springs surrounding said guide rods and seated against each of said pressure plates while bearing upon said housing to yieldably resist axial displacement thereof relative to said pressure plates;

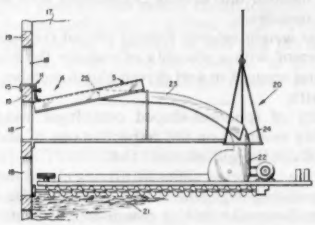
a pair of switches connectable for deenergizing said motor and engageable upon axial displacement of said housing in opposite directions;

an eccentric carried by said spindle and rotatable therewith;
a pressure pin radially displaceable in said housing and engaging said eccentric; and



a compression spring bearing upon said pin for urging same against said eccentric to resist rotation of said spindle relative to said housing beyond a predetermined extent upon deenergization of said motor.

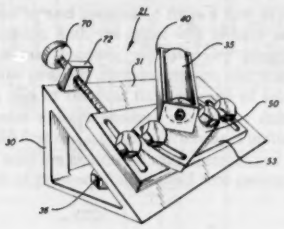
4,114,748
SILAGE DOOR GUIDE
Theodore B. Schulte, R.R., Dorchester, Iowa 52140
Filed Sep. 7, 1977, Ser. No. 831,231
Int. Cl.[2] B65G *11/18*
U.S. Cl. 193—33 **6 Claims**



1. For use in a silo having a plurality of vertically spaced openings separated by wall portions, a silage unloader having a discharge spout operatively associated therewith, an elongated inverted channel-shaped member having an intermediate portion resting on the discharge end of the spout to enable free sliding and pivoting movement of said member relative to the spout, said member having an outer end spaced outwardly from the discharge spout, and a hanger connected to and extending upwardly from said member, outwardly of said intermediate portion, and detachably engaging over one of said wall portions for supporting said outer end of the member adjacent to and in alignment with one of said openings of the silo, said hanger and spout providing the sole support from said member.

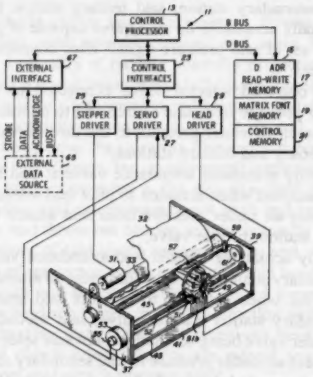
4,114,749
ROLL CONVEYOR FOR A MACHINE TOOL
John C. Carroll, 766 Thompson Rd., N. Syracuse, N.Y. 13212, and John M. Carroll, 239 Esther St., Minoa, N.Y. 13116
Filed Aug. 25, 1977, Ser. No. 827,474
Int. Cl.[2] B65G *13/12*
U.S. Cl. 193—35 C **5 Claims**

1. A conveyor for conducting cylindrical work elements toward and away from a machine tool which imparts a spiral motion to the work and wherein the work is coaxially aligned with the working centerline of the machine including
a frame having a planar horizontally aligned bed,
a series of brackets movably mounted upon said bed to move toward and away from the work along a path of travel normal to the working centerline of the machine, each bracket having an inclined surface facing the work that is parallel with the centerline of the machine and angularly disposed with respect to the bed,
means to adjustably position the brackets upon the bed,
a support plate slidably supported upon the inclined surface of each bracket so that the plates are movable up and down said surfaces,



means to adjustably position the support plates upon the inclined surface,
a housing pivotably supported upon each of the support plates having a conveyor roll rotatably supported therein for contacting and transporting the work, and
means to pivotably position each of said housings upon said support plates so as to angularly position the rolls in respect to the work.

4,114,750
PRINTER SYSTEM HAVING LOCAL CONTROL FOR DYNAMICALLY ALTERABLE PRINTING
Henry S. Baeck, Campbell; William C. Bennett, Menlo Park; David C. Condon, Monte Sereno; Harold R. Gillette, Los Altos, and Donald G. Herbert, San Ramon, all of Calif., assignors to Hydra Corporation, Mountain View, Calif.
Filed Aug. 6, 1975, Ser. No. 602,303
Int. Cl.[2] B41J *5/30*; G05B *19/40*
U.S. Cl. 400—279 **6 Claims**



1. Printing apparatus for developing a printout of character print data contained within a data stream received from a remote source, comprising:
print medium transport means including tractor means responsive to first signals and operative to move a print medium in a first direction;
print head means responsive to second signals and operative to cause communicative characters to be developed on said print medium;
carriage means responsive to third signals and operative to alternatively move said print head means in second and

third opposite directions transverse to said first direction, said carriage means being further operative to develop position feedback signals;

input means responsive to a stream of input data including character print data, character position data and format data and operative to develop command signals;

look ahead scan means for scanning said print command signals and for determining the distances between the last print position to be assumed by said print head means during a current print line and the respective opposite extreme print positions to be assumed by said print head means during the next succeeding print line and for developing a motion signal indicating which of said extreme print positions is closest to said last print position;

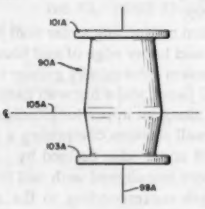
control means responsive to said motion signals, said feedback signals and said command signals and operative to develop said first signals, said second signals and said third signals such that said print head means and said print medium are relatively positioned to effect printout of the first line of print characters, and thereafter upon completion of the printing of the last character on the first and each succeeding print line, said print medium is advanced and said carriage means is caused to move said print head means directly from its last print position of each print line to the nearest one of said opposite extreme print positions of the next succeeding print line without first returning to a fixed reference position and is thereafter caused to move toward the other extreme print position as printout of said next succeeding print line is effected.

4,114,751

PRINTING MACHINE WITH AUTOMATIC OFF-CENTER CROWN ROLLER RIBBON-WEAR COMPENSATION

Robert W. Nordin, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 22, 1976, Ser. No. 734,779
Int. Cl.[2] B41J *35/04*
U.S. Cl. 400—248 **3 Claims**



1. An improved printing machine wherein an inked ribbon is passed between a record medium and type dies for squeezing the inked ribbon between the record medium and the type dies, thereby wearing and stretching the ribbon wherever the ribbon is so squeezed, means for drawing the ribbon lengthwise past the type dies, at least one crown roller for turning the direction of the ribbon and for guiding the ribbon in its width dimension, the crown roller having a generally barrel shape with two ends, a major diameter, and a minor diameter, wherein the improvement comprises:

the two ends of the crown roller spaced apart by a distance substantially greater than the width of the ribbon;

the major diameter of the crown roller being located closer to a near end than a far end of the crown roller;

the major diameter of the crown roller positioned to locate a new ribbon so as to squeeze the new ribbon principally nearer a first ribbon edge closer to the far end of the crown roller, whereby the ribbon nearer the first edge of the ribbon is stretched; and

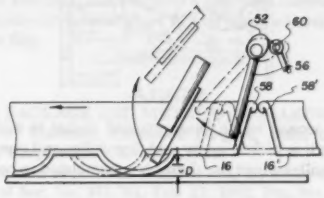
sufficient space between the first edge of the ribbon and the far end of the crown roller to accommodate the ribbon as through wear and stretching the ribbon migrates on the crown roller to bring a second edge of the ribbon, opposite the first edge of the ribbon, toward the major diameter of the crown roller, thereby locating a worn ribbon so as to squeeze the worn ribbon principally less near the first edge of the ribbon.

4,114,752

ALL PURPOSE INDEXING DEVICE

Robert J. Schiek, 15 River Rd., Brunswick, Me. 04011

Filed Feb. 9, 1977, Ser. No. 766,873
Int. Cl.[2] B65G *47/22*
U.S. Cl. 198—491 **5 Claims**



1. An all purpose indexing device for use with a conveyor having a moving conveyor belt and a fixed frame, and for interrupting the motion of baking pans having space rows of dough-receiving indentations on the conveyor belt comprising:

an indexing bar means disposed across a conveyor belt pivotally mounted to the frame;

indexing finger means adjacent the mid-portion of said indexing bar means for engaging the indentations of the baking pans when said indexing bar is pivoted downwardly toward the conveyor belt;

reciprocating means connected between said indexing bar means and the conveyor frame adjacent lateral ends of said indexing bar means for reciprocally moving said indexing bar means from an upper position whereby said indexing finger means are clear of the baking trays and downwardly to a position at which said indexing finger means are in engagement with the indentations of the baking pans;

sensing means disposed across the conveyor for sensing the passage of a leading and trailing edge of the baking pans on the conveyor; and

switching means engagable with said sensing means for varying the speed of the conveyor belt from a first slower feed speed to a second faster, tray-conveying speed.

4,114,753

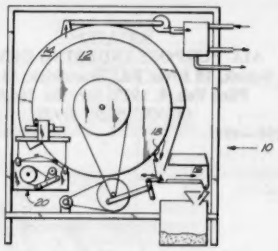
SLUDGE FILM CONVEYING DEVICE

Gote Herbert Egard Bjermo, and Paul Einar Tresjo, both of Vasteras, Sweden, assignors to System AB Infotenik, Vasteras, Sweden

Continuation-in-part of Ser. No. 651,250, Jan. 22, 1976, abandoned, which is a division of Ser. No. 519,559, Oct. 31, 1974, Pat. No. 3,960,725. This application Aug. 4, 1977, Ser. No. 821,726
Claims priority, application Sweden, Nov. 5, 1973, 731496
Int. Cl.[2] B65G *37/00*; B01D *1/22*
U.S. Cl. 198—608 **8 Claims**

1. A sludge film applicating device for applying a film onto a carrier, comprising: a frame; means supporting said frame for longitudinal and pivotal adjustment relative to the carrier; a first roller rotatably mounted in said frame; a second roller also rotatably mounted in said frame near said first roller, said first and second rollers being so mounted as to define therebetween a narrow gap into which the sludge to be treated is directed; a third roller rotatably mounted above said first roller and in contact therewith so that said first and third rollers rotate oppositely to each other; means for mounting said third roller above said first roller, said mounting means having force-

adjusting means thereon for adjusting the force which said third roller exerts on said first roller; and means above said second roller for supplying sludge to said second roller where-



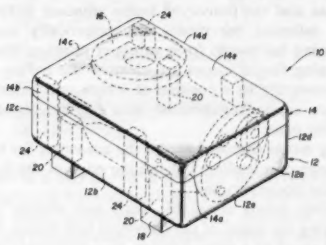
upon said second roller transports said sludge to said narrow gap where it is picked up by said first roller and conveyed to said third roller where the sludge is accumulated to contact the carrier.

4,114,754

CONTAINER INTEGRATED WORK STAND

Carl Lee Aley, Claymont, Del., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 29, 1976, Ser. No. 745,713
Int. Cl.[2] B65D *85/68*
U.S. Cl. 206—319 **8 Claims**



1. A container and integrated work stand in combination, for shipping a component and supporting a like component to be replaced at a replacement location, comprising:

a. a body portion having front, rear, side and bottom walls joined together to form an enclosure defining corresponding front, rear, side and bottom walls of the container;

b. a plurality of mounting means attached to the body portion at selected locations within the enclosure and associated securing means for securing a replacement component to the mounting means, in a desired position, within the enclosure;

c. a lid portion forming at least a top wall of the container and a base of the work stand;

d. a like plurality of support means attached at selected locations to the lid portion for supporting, in a desired position, a like component to be replaced at the replacement location, said lid portion and support means forming the work stand; and

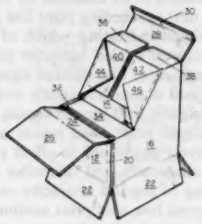
e. fastening means for fastening the body portion to the lid portion, wherein each of said mounting means is spaced adjacent to a corresponding one of said support means within the enclosure defined by the assembled combination of the container.

4,114,755

REINFORCED FORM-FITTING SHIPPING CONTAINER

John J. Aust, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 6, 1978, Ser. No. 867,400
Int. Cl.[2] B65D *85/00, 5/00*
U.S. Cl. 206—326 **7 Claims**



1. A blank of substantially rectangular outline defined by spaced upper and lower longitudinal edges and spaced transverse side edges, adapted to be formed into a stepped container having a reinforced inclined upper front wall, comprising

a series of rectangular blank sections including a front wall section, two side wall sections, and a rear wall section, arranged in side-by-side relation;

said front wall section comprising, in the order named, a lower front wall panel extending upwardly from said lower edge of said blank, an intermediate horizontal wall panel and an upper front wall panel, foldably joined to each other along spaced first and second longitudinal fold lines, respectively;

said rear wall section comprising a rear wall panel extending upwardly from said lower edge of said blank and having a transverse dimension substantially greater than that of said lower front wall panel, and a top wall panel joined to said rear wall panel along an upper longitudinal fold line;

each of said side wall sections comprising a side wall panel having a stepped upper edge defined by

a short lower score line aligned with said first fold line and having a length corresponding to the spacing of said first and second fold lines;

a short upper score line aligned with said upper fold line and having a length corresponding to the transverse dimension of said top wall panel;

a diagonal score line interconnecting said lower and upper score lines;

said side wall sections each including:

a first reinforcing flap foldably joined to said lower score line and defined by slots extending from the ends of said lower score line to the upper edge of said blank,

a second reinforcing flap foldably joined to said upper score line and defined by a slot extending from one end of said upper score line to the upper edge of the blank and by a perpendicular score line extending from the other end of the upper score line to the free edge of the blank,

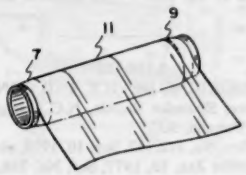
a stabilizing flap hingedly attached to said second reinforcing flap, and

a reinforcing panel foldably joined to said side wall panels along said diagonal score line and being separated from said stabilizing flap along a cut means extending from said perpendicular score line to a free edge of said stabilizing flap.

4,114,756
WINDING CORE FOR HEAT SHRINKABLE FILM MATERIAL

Raymond B. Dacey, Simpsonville, and Frederick David Stringer, Greenville, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 13, 1976, Ser. No. 749,945
Int. Cl.[2] B65D *85/67*; B65H *77/02*
U.S. Cl. 206—389 **10 Claims**

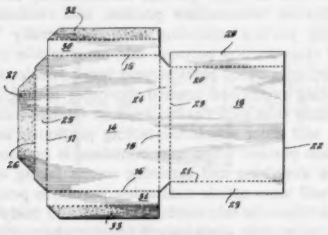


1. A roll of heat shrinkable thermoplastic film, comprising:
a generally cylindrical core having a central portion and terminal end portions, said end portions having a gradually lesser outer diameter than said central portion of said core; and
convolutions of said film about said core, each of said convolutions comprising edge areas which would otherwise tend to shrink in an axial direction and thus elongate circumferentially after winding and during storage, said areas which tend to elongate overlying and contacting said terminal end portions of less outer diameter after storage.

4,114,757
BOOK CARTON

William G. Sieffert, Joliet, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 11, 1977, Ser. No. 840,559
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—424 **2 Claims**

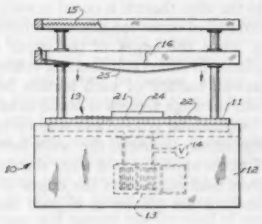


1. A blank made of foldable paperboard or similar sheetlike material adapted to be erected into a book carton, comprising:
a rectangular bottom panel having horizontal top and bottom edges and vertical lateral side edges, said top and bottom edges defining a lengthwise dimension in the carton to be erected, said length being greater than the corresponding dimension of the book to be contained in said carton;
a first end wall panel connected by a vertical fold line along a first lateral edge of said bottom panel;
a second end wall panel connected by a vertical fold line along a second lateral edge of said bottom panel;
a rectangular top panel having horizontal top and bottom edges and vertical lateral side edges, said top and bottom edges of said top panel defining a lengthwise dimension less than the length of said bottom panel but at least as great as the length of the book to be contained in the carton, said top and bottom edges of said top panel being spaced inwardly from said top and bottom edges of said botton panel a predetermined distance;
said end walls having top and bottom edges angled away from the lateral ends of said top and bottom edges of said bottom panel and terminating at the level of said top and bottom edges of said top panel;
said top and bottom edges of said top and bottom panels each having side wall flaps hingedly connected thereto;
a first manufacturer's glue flap hingedly connected along one lateral edge of said blank, the top and bottom edges of said first glue flap tapering from said second end wall to the free edges of said first glue flap; and
second and third manufacturer's glue flaps connected along opposite horizontal edges of said blank adjacent said first glue flap.

4,114,758
PACKAGE AND METHOD OF MAKING

Eugene W. Coleman, Richmond Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Continuation of Ser. No. 542,510, Jan. 20, 1975, which is a division of Ser. No. 331,701, Feb. 12, 1973, Pat. No. 3,861,529, which is a continuation of Ser. No. 83,891, Oct. 26, 1970, abandoned. This application Sep. 1, 1977, Ser. No. 829,978
Int. Cl.[2] B65D *73/00*; B65B *31/00*
U.S. Cl. 206—471 **23 Claims**



1. The process of forming a skin package with a skin packaging machine comprising the steps of:
(a) positioning a plastic film on the platen of a skin packaging machine;
(b) heat softening the film;
(c) first positioning inserts on the platen and then applying a pressure differential to the film to force portions of the film into apertures in the platen thereby forming projections on the film only in selected areas;
(d) inverting the film and positioning the film as a base sheet on a skin packaging machine platen;
(e) positioning a product on the base sheet and then forcing a heat softened plastic covering film into engagement with the base sheet by establishing a pressure differential on the covering film.

4,114,759
PROTECTIVE PACKAGE

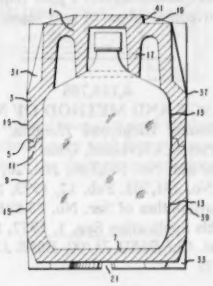
James Francis Maloney, Jr., Industry, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1977, Ser. No. 775,281
Int. Cl.[2] B65D *81/16*
U.S. Cl. 206—523 **12 Claims**

1. A package for protecting an object enclosed therein from mechanical shock comprising an upper section having a top endwall from which extends a unitary substantially vertical sidewall terminating in a lower edge; and a lower section comprising a bottom endwall on which the object rests when the package is in an upright position and from which extends a unitary substantially vertical sidewall terminating in an upper edge matching the lower edge of the upper section,
(1) the sections of approximately equal height being molded

from resiliently compressible material by means of a two-part mold, the parting line of the male and female components of which is located at about the midpoint of the outer wall of each section, said outer surface of each section tapering inward to the extent of the mold relief angle from the parting line toward the edge of each section and toward the endwall of each section, and

(2) the contour of the inner sidewall surface of the sections being adapted to conform substantially to the contour of the outer sidewall surface of the enclosed object, said inner sidewall surface of each section from the level of



parting line to the edge thereof is cored in such manner as to form a plurality of inner longitudinal channels which are matching when the edges of the upper and lower sections are placed in alined and abutting relationship and the outer sidewall surface of each section between the parting line and the edge thereof is cored in such manner as to form a longitudinal groove and wall on each side of the inner longitudinal channels, the walls being deformable when a force is applied to the inner shoulder thereof, and the grooves matching when the edges of the upper and lower sections are placed in aligned and abutting relationship.

4,114,760

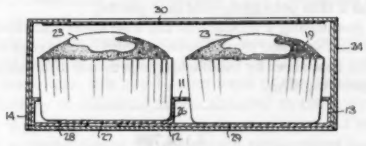
BAKING AND PACKAGING SYSTEM

Charles E. Entenmann, Bayshore, N.Y., assignor to Entenmann's Bakery, Inc., Bayshore, N.Y.

Division of Ser. No. 525,958, Nov. 21, 1974, Pat. No. 4,002,773. This application Jul. 15, 1976, Ser. No. 705,433

Int. Cl.[2] B65D *57/00, 85/00, 5/48*

U.S. Cl. 206—562 **1 Claim**



1. A system for packaging bakery items comprising:

a shallow tray of heat resistant paperboard including

an upper planar portion having a plurality of spaced openings of predetermined size and shape, said upper planar portion constituting the uppermost portion of the tray,

a lower planar portion extending under the openings in the upper planar portion, and

integral means for connecting the upper planar portion in spaced relation above the lower planar portion;

a plurality of pleated paper baking liners fitting within the openings in the upper tray, one liner in each opening with the bottom of the liner being supported by the lower planar portion of the tray and the side wall of the liner being supported against bulging outward when filled with batter by the edges of the corresponding opening in the upper planar portion of the tray engaging the side wall of the liner in substantially the central portion thereof; and

a covering for the tray and liners to seal the contents of the liners from contamination during delivery and display of the bakery items, the covering comprising a rectangular paperboard carton having a top, four sides, and a bottom, the size of the tray being predetermined to fit snugly within the four sides of the carton to prevent shifting of the contents of the liners with possible damage to said contents.

4,114,761

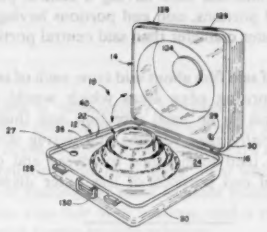
SHOCK ABSORBING DEVICE AND CONTAINER

Wayne E. Kleiner, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 612,142, Sep. 10, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,221

Int. Cl.[2] B65D *81/16*

U.S. Cl. 206—591 **6 Claims**



1. A container having mating body and cover parts for housing an object therebetween, said parts being joined by a hinge and at least one of said parts being of hollow double wall construction comprising integral inner and outer shells with said inner shell comprising a shock absorbing and retaining means which comprises a wall having an inner article contacting portion and an outer portion connected by at least one resilient flexible intermediate portion, said resilient flexible intermediate portion extending with a generally V-shaped sinusoidal cross section between said inner article contacting portion and said outer portion, said inner article contacting portion being positioned toward the other mating part to a greater extent than said flexible resilient intermediate portion such that said inner article contacting portion is above said intermediate portion when said container is positioned with said shock absorbing and retaining means facing upwardly, whereby said inner article contacting portion is positioned to contact an object in said container when said body part and said cover part are in a mating relationship and to deform said resilient flexible intermediate portion thereby causing said intermediate portion to resiliently urge said inner article contacting portion toward said object, whereby said object is resiliently and immovably housed within said container.

4,114,762

WORM HARVESTING

Steven G. Beal; Arthur Ceballos, and Dolores D. Ceballos, all of 508 Sonoma St., Carson City, Nev. 89701

Filed Nov. 1, 1976, Ser. No. 737,754

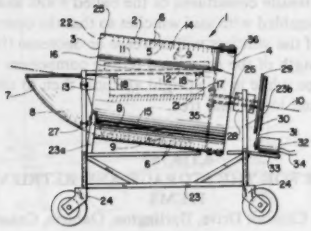
Int. Cl.[2] B07C *9/00*

U.S. Cl. 209—78 **16 Claims**

1. Worm harvesting method which comprises

subjecting soil from which worms are to be harvested to rotation about a substantially horizontal axis in a peripherally confined rotating path which has a plurality of correspondingly rotating and inwardly projecting worm gathering projections operatively distributed in spaced apart relation thereon and which includes a lower path portion

containing the soil and an upper path portion containing a gravity release zone extending in intersecting relation to the vertical plane of such horizontal axis, cascading the soil upon itself and gathering worms therefrom by the projections in the lower path portion and carrying such



worms by the projections to the gravity release zone in the upper path portion during the rotation, and

collecting the gathered worms by depositing such worms by gravity upon gravity release thereof from the projections at the gravity release zone.

4,114,763

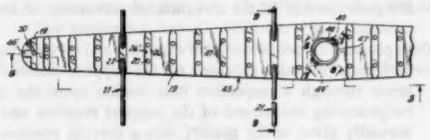
COMPOSITE UNITS FOR DISPLAYING MERCHANDISE

Arthur Hochman, Union City, N.J., assignor to Art-Phyl Creations, Newark, N.J.

Continuation-in-part of Ser. No. 480,344, Jun. 18, 1974, Pat. No. 3,939,985. This application Feb. 24, 1976, Ser. No. 660,757

Int. Cl.[2] A47F *5/04, 7/00*

U.S. Cl. 211—57.1 **4 Claims**



1. A display assembly comprising a rack, a hook member having a free end mounted to said rack, said rack including a plurality of transverse overcut notches therein, each notch having a pair of holes therein for receiving therein a pair of said hook members, said hook members being oppositely oriented, a safety bumper guard connected to said rack and extending beyond the free ends of said hook members to prevent puncture wounds caused by an encounter with said hook members, said rack having a longitudinal overcut notch located at each end of said rack, each said longitudinal notch having a hole therein for receiving therein said safety bumper guard, a sleeve, said sleeve having at least one laterally extending nub, a collar disposed on said rack, said collar being mounted on said sleeve for slidably mounting said rack on said sleeve, said collar having a bottom surface and having at least one lower slot corresponding to said nub formed therein, said nub being registrable in said slot when said collar is mounted on said sleeve and said collar having a top surface having at least one upper slot formed therein for thereby nesting a second sleeve into said collar until the laterally extending nub thereof nests with said upper slot.

4,114,764

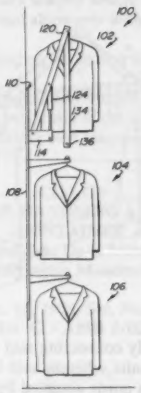
HANGER

Walter Rich, 1911 Spruce St., Philadelphia, Pa. 19103

Continuation-in-part of Ser. No. 564,236, Apr. 2, 1975, Pat. No. 4,006,826. This application Sep. 15, 1976, Ser. No. 723,377

Int. Cl.[2] A47F *5/08*

U.S. Cl. 211—100 **6 Claims**



1. A hanger comprising structure attachable to a wall for supporting mounting brackets, a pair of mounting brackets for projecting in spaced parallel cantilever relation from said structure for supporting a hanger device, a hanger device including a hanger rail coupled to said brackets by a pair of arms, each arm having an upper end connected to said hanger rail and the lower end pivotably connected to one of said brackets, a pull-down bar pivotably connected to said hanger device between said arms for pivoting said arms about a horizontal axis to thereby lower the elevation of said hanger rail while bringing said hanger rail forward of said horizontal axis, compression means pivotably connected at a first end to at least one of said arms at a first point thereon and pivotably connected at a second end to at least one of said brackets at a second point thereon forward of said horizontal axis and below the elevation of said horizontal axis for maintaining said hanger rail in an upper position when said compression means is substantially fully extended and limit means secured to at least one of said brackets above said second point for maintaining said hanger rail in a lower position at which said hanger rail is accessible and at which said compression means is substantially fully compressed and below the elevation of said horizontal axis.

4,114,765

APPARATUS FOR ROTATING HEAVY OBJECTS

Yoichi Kojima, Tokyo, Japan, assignor to Planning Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,815

Int. Cl.[2] B65G *17/48*

U.S. Cl. 214—1 QC **3 Claims**

1. An apparatus for rotating a heavy object, said apparatus comprising:

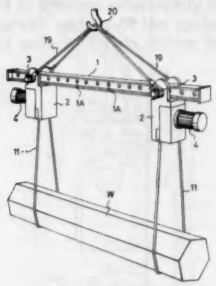
a horizontal beam, said beam having a plurality of longitudinally spaced openings formed along its length,

a pair of endless cord revolving units,

means for selectively and longitudinally adjustably attaching each revolving unit to said beam, said last mentioned means comprising a pair of pins, wherein each pin is insertable through registering apertures formed in a respective revolving unit and through one of said openings formed in said beam whereby said revolving units are secured to and longitudinally spaced along said beam,

means for holding said beam in an elevated position, said

holding means comprising hook means supported above said beam and at least one elongated flexible member, said flexible member secured at one end to one pin and at its other end to the other pin, wherein said flexible member is secured substantially at its midpoint by said hook means to thereby maintain said beam in an elevated and horizontal position; and



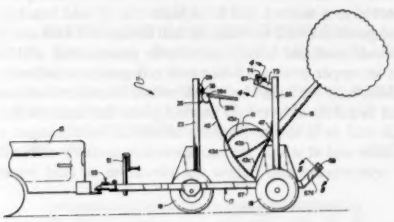
means for detachably connecting said object to said endless cord revolving units wherein said last mentioned means comprises endless cords actuated by said units and forming loops, said object being positioned within the loops formed by said endless cords whereby actuation of said units produces rotation of said object.

4,114,766

TREE CADDY

Bernard J. Decker, 3415 E. Livingston, Columbus, Ohio 43227, and Frederick J. Schmitt, 5184 Blair Ave., Canal Winchester, Ohio 43110

Filed Feb. 17, 1977, Ser. No. 769,381
Int. Cl.[2] A01G *23/04*
U.S. Cl. 214—3 **9 Claims**



1. A machine for use in transplanting trees comprising:

(1) means, including a frame having a plurality of upright members secured to said machine for lifting a tree, after the tree has been severed from the earth, the roots of the tree and the soil embracing said roots has been balled and encircled with a tensile constituent;

(2) means of transporting said tree to any selected site where a hole has been made for receipt of said tree; and

(3) means of lowering the tree so that the tree and balled roots thereof are positioned correctly in said hole, wherein there is provided an undercarriage having a plurality of wheels by which the machine is supported; the frame consisting of a plurality of normally substantially horizontal members secured to and supported by said wheels; three upright members secured to the horizontal members and extending substantially vertically upwards and substantially parallel with each other and wherein a pair of said upright members are laterally spaced opposite to each other and wherein the third upright member is displaced longitudinally forward of said pair of laterally spaced upright members and is positioned laterally between said pair of upright members;

hangers supported by the upper ends of each of the upright members;

winches secured to each of the hangers;

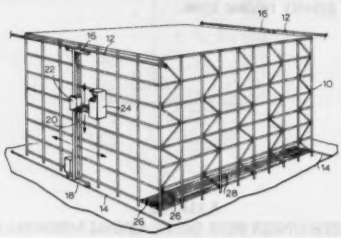
a plurality of tensile components capable of being secured to the tensile constituent of the balled roots and operably assembled with said winches so that the operation of each of the winches will increase or decrease the effective length of the associated tensile component to raise said tree while in an upright attitude, then to tilt, transport, and lower said tree.

4,114,767

APPARATUS FOR THE STORAGE AND RETRIEVAL OF ITEMS

Nick Fur, 252 Camelot Drive, Burlington, Ontario, Canada (L7L 2G7)

Continuation of Ser. No. 690,003, May 26, 1976, abandoned.
This application Apr. 21, 1977, Ser. No. 789,701
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **16 Claims**



1. An advancing member for an item storage and retrieval system comprising at least one storage path having therealong a plurality of spaced successive stations each adapted to receive an item, the member comprising:

(a) an elongated support member extending over a plurality of stations and mountable for reciprocating movement in the path parallel to the direction of movement of items therein;

(b) a plurality of pendulous item engaging and driving members each pivotally mounted on the support member to move through a respective item station upon the said reciprocating movement of the support member and to normally pivot under gravity into a driving position in which it can engage an item at the station to drive the engaged item to the next succeeding station in the path;

(c) a locking member for each engaging and driving member engageable therewith to lock the member in said driving position during advancing movement of the advancing member, while permitting movement of the driving member to an inoperative position during reverse movement of the advancing member;

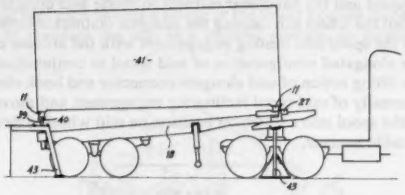
(d) a plurality of pendulous item detector members each pivotally mounted on the support member at or adjacent to a respective station to normally pivot under gravity into an item engaging position; and

(e) connecting means each connected between a respective item detector and the locking member of the immediately preceding driving member and movable longitudinally of the support member, whereby upon the presence of an item in the said immediately succeeding station the item detector moves the said locking member by the said longitudinally movable connecting means to unlock the respective driving member so that it will move to an inoperative position during advancing movement of the advancing member.

4,114,768
CONTAINER COMPANION PLATE

Donald Keir Robertson, 128 Lawrence Street, Bedford Park, Perth, Western Australia, Australia (6052)

Filed Jun. 29, 1977, Ser. No. 811,397
Int. Cl.[2] B60P 1/64
U.S. Cl. 214—152 3 Claims

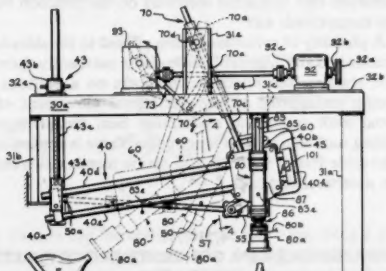


1. A method of loading a front and rear supported elevated container onto the tray or chassis of a vehicle including; inclining said chassis downwardly towards the rear, providing a skate member on its upper surface, said skate member being adapted to travel along the chassis or on longitudinal tracks provided on the tray of the vehicle, reversing said vehicle under the elevated container until a container companion plate mounted to the leading underside of the container engages with the skate member, the continual reversal and incline of the vehicle tray lifts the container clear of the front supports, the skate member and leading companion plate travel along the longitudinal tracks provided and positively engage with locking means at the forward end of the tray, providing hydraulic jacks at the rear portion of the tray, lifting a second container companion plate attached to the trailing underside of the container free of the rear supports and lowering it into a locked position on the rear of the vehicle tray.

4,114,769
ARTICLE TRANSFER METHOD

Mario Cuniberti, Columbus, Ohio, and Edwin C. Pinsenschaum, Phoenix, Ariz., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 662,054, Feb. 27, 1976, Pat. No. 4,018,342.
This application Jan. 13, 1977, Ser. No. 759,216
Int. Cl.[2] B65G 47/91
U.S. Cl. 214—152 4 Claims



1. A method for the transport of a generally frusto-conically shaped article having a vertical axis passing through the center of both ends of said article from an article loading station to an article unloading station which comprises the steps of:

grasping said frusto-conically shaped article at said article loading station;

rectilinearly transporting said frusto-conically shaped article from said article loading station to said article unloading station;

simultaneously with said transporting, tilting said frusto-conically shaped article to achieve a positional orientation corresponding to the axis of orientation of said article unloading station;

simultaneously with said transporting and tilting, rotating said frusto-conically shaped article about its vertical axis to achieve rotational alignment with said article unloading station;

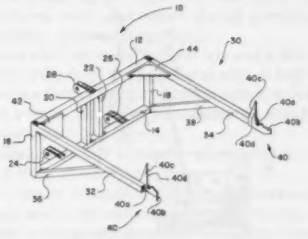
ceasing said transporting at said article unloading station; and

releasing said frusto-conically shaped article at said article unloading station while still in the tilted and rotated orientation achieved during said transporting.

4,114,770
IMPLEMENT FOR HANDLING A BULK TOBACCO CONTAINER

Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed Oct. 15, 1976, Ser. No. 732,798
Int. Cl.[2] A24B 1/02
U.S. Cl. 214—130 R 4 Claims



1. A tractor carried bulk tobacco container handling implement adapted to be connected to a three-point hitching mechanism of a farm tractor for supporting and handling a bulk tobacco container of the type having outwardly extending support means extending from the sides thereof, said bulk tobacco container handling implement comprising: a rectangular hitching frame adapted to be operatively connected to the three-point hitching mechanism of a farm tractor, said hitching frame including an upper transverse member, a lower transverse member normally spaced below said upper transverse member, a pair of laterally spaced end connecting members connected between respective ends of said upper and lower transverse members such that a rectangular frame is formed by said upper and lower transverse member and said end connecting members; three-point hitch connecting means secured to said rectangular hitching frame for operatively connecting said implement to the three-point hitching mechanism of said farm tractor; a pair of laterally spaced support arms secured to said rectangular hitching frame and extending generally rearwardly therefrom when attached to said tractor; a pair of diagonal braces secured between said hitching frame means and said laterally spaced rearwardly extending support arms, each diagonal brace secured about one end to a lower portion of said hitching frame means and extending upwardly therefrom where the other end thereof joins a respective support arm intermediately the respective ends thereof; container support means disposed about the ends of each of said support arms about the rearward ends thereof opposite said hitching frame for engaging and supporting the outwardly extending support means of said bulk tobacco container, said container support means including a single one piece support member disposed about the rearward end of each support arm about the inner side thereof and wherein each support member comprises a generally arcuately shaped seat area defined for supporting

said outwardly extending support means extending from said bulk tobacco container, an outwardly flanged guide portion integrally formed in said single one piece support member rearwardly of said seat area for guiding and aligning said bulk tobacco container handling implement with a bulk tobacco container to be engaged by said implement, and an elevated back disposed immediately adjacent said seat area opposite said flanged guide portion and extending above the area of said defined seat area for appropriately engaging said outwardly extending support means extending from the sides of said bulk container when said implement is being positioned and maneuvered to pick up a particular bulk tobacco container; and insert means insertable between each respective support arm and each single one piece support member for varying the effective width between said two support members of said bulk tobacco container handling implement.

4,114,771

BULK WIRE STORAGE AND TRANSPORT SYSTEM

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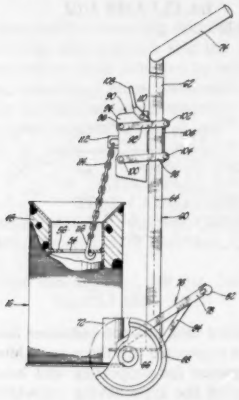
Filed Jun. 14, 1977, Ser. No. 806,413
Int. Cl.[2] B62B *1/06*
U.S. Cl. 214—384 **2 Claims**



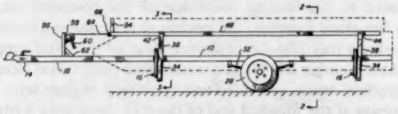
1. A wire storage and moving system comprising a spool, said spool including a normally upright hollow cylindrical portion with open ends, said cylindrical portion having a height substantially greater than its diameter, said cylindrical portion including frusto-conical flange portions formed at the respective ends thereof and upon either of which flanges said spool is adapted to be supported in an upright manner, a multi-layered coil of wire wrapped about said cylindrical spool portion and confined between said spool flange portions, a radially inwardly projecting annular flange formed internally of said hollow cylindrical portion and axially inwardly spaced from said flange portions; and a wheeled device adapted to disconnectably coact with said spool, said device including a generally upright beam element, a transverse beam fixed to the lower end of said upright beam element, a pair of spaced wheel members coaxially mounted at the ends of said transverse beam, a handlebar element secured to the upper end of said upright beam and extending rearwardly and upwardly thereof, an arcuate cradle fixed to said transverse beam intermediate said wheel members and projecting forwardly of the transverse beam, a slide member supported upon said upright beam for movement along the length thereof, said slide member including a locking element for adjustably fixing the position of said slide member along the length of said upright beam so as to be positioned vertically above the uppermost of said spool flanges; an elongate connector element fixed at one end to said slide element and including another end freehanging relative to said slide member, a hook element connected to the free end of the connector element, said wheel device being movable to a position in which said arcuate cradle is disposed circumferentially proximate the lower portion of said multi-layered coil of wire, the free end of said elongate element being adapted to extend within the hollow portion of said spool to enable the hook element to connectably engage with said annular flange, a foot engaging bracket element projecting from said transverse beam and extending rearwardly and upwardly thereof whereby forces may be applied to the foot engaging bracket element and the handlebar element to rotate said upright beam about the wheel axis causing the elongate connector element to lift the spool into nesting engagement with the arcuate cradle, the elongated configuration of said spool in conjunction with the lifting action of said elongate connector and hook elements internally of said spool facilitating engagement and movement of the spool into a transport position on said wheeled device in a stable manner.

4,114,772

PONTOON BOAT TRAILER

Ralph E. Beelow, 4243 - 13th Ave. South, Minneapolis, Minn. 55404

Filed Aug. 15, 1977, Ser. No. 824,538
Int. Cl.[2] B60P *3/10*
U.S. Cl. 214—512 **3 Claims**



1. A trailer especially suited for transporting and launching pontoon type boats of the type including a generally planar, rectangular, deck surface with first and second elongated floatation members affixed to the underside of said deck proximate opposed side edges thereof, comprising:

(a) a trailer bed mounted on wheels, the width of said bed being less than the spacing between said floatation members;

(b) a plurality of linkage members pivotally coupled at one end thereof to said trailer bed at spaced apart locations along the length and at either side thereof;

(c) a movable frame member having opposed sides thereof pivotally secured to the other ends of said plurality of linkage members, the opposed sides of said frame being spaced apart by a distance which is less than the spacing between said floatation members on the pontoon boat to be transported; and

(d) A plurality of roller assemblies affixed to the sides of said trailer bed and adjustably extendable outwardly therefrom for abutting the floatation members on a pontoon boat being transported to prevent lateral movement of said boat with respect to said trailer bed, the arrangement being such that when a longitudinal force is applied to said movable frame member, said frame member is translated in a vertical direction.

4,114,773

FEEDING DEVICE OF A CONCRETE BLOCK SPLITTING APPARATUS

Yoji Sekiguchi, Maebashi, Japan, assignor to Katsura Machine Co., Ltd., Maebashi, Japan

Filed Aug. 5, 1977, Ser. No. 822,323
Claims priority, application Japan, Aug. 12, 1976, 51-108112[U]
Int. Cl.[2] B65G *25/04*
U.S. Cl. 214—623 **8 Claims**

1. A feeding device of a concrete block splitting apparatus, comprising:

a frame structure;

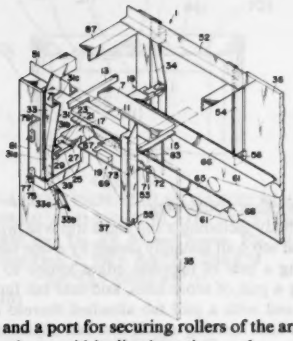
a table for lifting a concrete block up to a predetermined position;

said table having upwardly pivotable arms extending in the opposite direction, said arms each having a roller at the end thereof;

means for moving said table in the vertical direction;

legs outwardly pivotably connected to said frame structure at the opposite sides with respect to said table;

said legs each having a spring at the lower portion thereof to maintain the legs in a vertical posture, an inclined



portion and a port for securing rollers of the arms at the position above said inclined portion, and

receiving members for supporting the concrete block at the predetermined position;

said receiving member being connected to the upper portion of said legs,

whereby as said table with the concrete block placed thereon is moved upward together with said arms and rollers, said legs are pivoted outwardly and retracted to the original position to receive the concrete block.

4,114,774

CLOSURE CAP

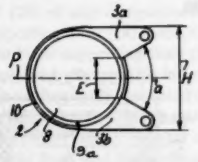
Albert Scheidegger, 30 rue Caporal Morange, 69100 Villeurbanne, France

Filed Dec. 21, 1977, Ser. No. 862,915

Claims priority, application France, Dec. 23, 1976, 76 39882

Int. Cl.[2] B65D *41/42*

U.S. Cl. 215—250 **3 Claims**



1. A closure cap for bottles and the like comprising a generally circular disc having an annular depending skirt, two tear tab portions extending rearwardly at an angle to each other from said skirt and forming a V-shaped space between them, with the legs of the V being spaced apart at their junction with said skirt a distance E, the outer edges of said tab portions being in substantially parallel planes spaced apart a distance equal to the diameter of said cap for guiding contact with the side walls of feeding equipment, the angle between said tab portions being such that the tab portions will both be tangent to a circle having a diameter equal to that of said cap to permit an identical cap to enter between the tab portions and to abut said cap without riding up on the tab portions.

4,114,775

CAP WITH SEALING LINER

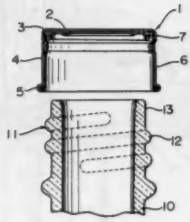
Tokujiro Shinozaki, Nagoya, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1977, Ser. No. 774,143

Claims priority, application Japan, Mar. 11, 1976, 51-25538; Nov. 18, 1976, 51-137773

Int. Cl.[2] B65D *53/00*

U.S. Cl. 215—324 **9 Claims**



1. A cap for use in sealing a container of the type including an opening portion having therein an opening surrounded by a sealing surface including an upper rim and inner and outer peripheral surfaces, with an exterior thread provided below the sealing surface, said cap comprising:

a metallic cap shell having a circular top and a skirt extending downwardly from the peripheral edge of said top, said skirt having a thread forming portion which is deformable along the exterior thread of a container on which the cap is to be used; and

a flexible liner provided inwardly of said top of said cap shell, said liner comprising:

an outer annular protrusion extending downwardly from said top, said outer annular protrusion having an inner diameter substantially equal to, or slightly larger than, the outer diameter of the sealing surface of the container on which the cap is to be used, said outer annular protrusion having a radially inner wall extending substantially perpendicular to said top, said inner wall of said outer annular protrusion forming means for intimately sealing against the outer peripheral surface of the container on which the cap is to be used, said outer annular protrusion having an upright radially outer wall which is spaced radially inwardly from the inner circumferential surface of said skirt; and

an inner annular protrusion extending downwardly from said top at a position radially inwardly of said outer annular protrusion, said inner annular protrusion having a substantially triangular cross-sectional configuration, said inner annular protrusion having an inner diameter substantially equal to, or slightly smaller than, the inner diameter of the sealing surface of the container on which the cap is to be used, said inner annular protrusion including inner and outer walls which converge downwardly at an apex angle of 30° to 50°, said outer wall being inclined upwardly and radially outwardly and forming means for abutting against the inner circumferential edge of the upper rim of the sealing surface of the container on which the cap is to be used.

4,114,776

CONTAINER, PARTICULARLY FOR COLLECTING PRODUCTS TO BE RECYCLED

Ernest Pluss, 115, route de Peney, 1214 Vernier, Switzerland

Filed Dec. 20, 1976, Ser. No. 752,553

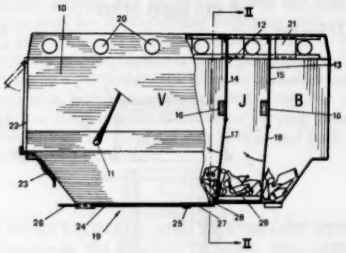
Claims priority, application Switzerland, Dec. 22, 1975, 16652/75

Int. Cl.[2] B65D *85/00, 25/04*

U.S. Cl. 220—22 **3 Claims**

1. A container, particularly for products recuperated for

recycling, comprising a body of generally rectangular shape in plan having long side walls joined by narrow end walls and a bottom and having a greater height than width, means defining a plurality of discrete openings spaced along the top of the container body for the introduction of refuse products, transverse partitions dividing the container body into a plurality of



discrete compartments each associated with at least one said opening, each partition being formed by a fixed vertical upper panel spaced above the bottom of the container and a lower flap hinged to a lower edge of the panel, and means for locking the flaps in a closed position and for individually unlocking the flaps to allow the contents of the different compartments to be successively removed through said outlet means.

4,114,777

FOLDED CIGARETTE BOX

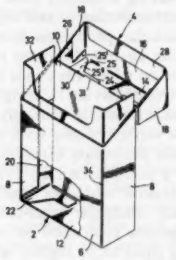
Hans-Joachim Fröhling, Hamburg, and Werner Rothe, Rellingen, both of Fed. Rep. of Germany, assignors to H. F. & Ph. F. Reemtsma, Hamburg, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,830

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650195; Dec. 4, 1976, 2655113

Int. Cl.[2] B65D *5/66*

U.S. Cl. 229—44 CB **6 Claims**



1. A container having a body and a hinged lid for cigarettes or similar articles, said body being formed from a blank having a front wall, a bottom wall, a rear wall and a lid having a rear wall integrally hinged to the rear wall of the body, a lid front wall and a lid top wall, with folding edges between adjacent walls, some of said walls having side flaps projecting therefrom along associated folding edges and having a width dimension corrsponding to the full width of the completed container, others of said walls having side flaps having a width dimension that is reduced relative to said full width dimension and which extend from others of said walls such that said reduced width flaps are located on the interior of said completed container, said container being held together by adhesive bonding between said full width flaps and said reduced width flaps,

at least one pair of said reduced width side flaps being provided with extending portions each having outer edges lying along a line that extends through the outer edges of said full width flaps.

4,114,778

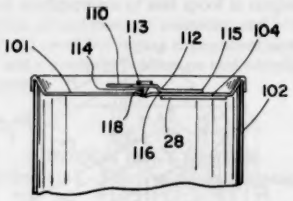
SANITARY DRINKING SPOUT FOR LIQUID CONTAINER WITH TEAR TAB

Chester L. O'Neal, 101 S. Locust, Greencastle, Ind. 46135

Continuation-in-part of Ser. No. 616,568, Sep. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 513,762, Oct. 10, 1974, Pat. No. 3,951,316. This application Jan. 6, 1977, Ser. No. 757,354

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—267 **7 Claims**



1. A container comprising:

a main body including a rim and a top wall with an aperture in said top wall sealingly closed by a tear tab, said tear tab having a pair of opposite edges joined to said top wall along a pair of score lines, said tear tab further having a first end with a pull tab attached thereto and with said score lines meeting at said first end adjacent said pull tab, said tear tab having a second end opposite said first end with said second end positioned adjacent said rim, said pull tab having a handle portion and an elongated main body portion with at least a portion of said main body portion fixedly attached to said tear tab along its length; and

means, including a pierce button having a pointed end and extending through and beneath the unattached portion of said pull tab to a point on said tear tab adjacent said first end thereof, for piercing said top wall and for initiating tearing along said score lines adjacent said first end when said pierce button is depressed.

4,114,779

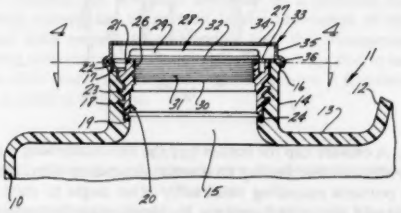
BUNG HOLE ASSEMBLY

Andrew Joseph Stoll, III, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 10, 1977, Ser. No. 767,596

Int. Cl.[2] B65D *41/04, 51/18, 39/00*

U.S. Cl. 220—288 **12 Claims**



1. A bung hole closure assembly for a plastic drum comprising:

a tubular projection formed on said drum having internal threads and including an annular internal sealing surface, a bushing inserted into said tubular projection having external threads threadably engaging said internal threads of said projection and including internal threads, annular sealing means adjacent said bushing sealingly engaging

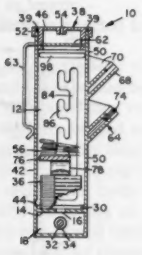
said sealing surface, releasable interengaging means respectively disposed internally on said tubular projection and externally on said bushing allowing slipping engagement when said bushing is rotated in a tightening direction and locking engagement upon rotation in an opposite direction, said interengaging means being accessible from the exterior of said closure assembly whereby said bushing can be rotated in said opposite direction, said tubular projection and said bushing defining an opening in said drum, said threadably engaged threads of said projection and bushing being of a larger thread form than said internal threads of said bushing.

4,114,780

COMBINATION INDUSTRIAL RAZOR BLADE DISPENSER AND USED BLADE RECEIVER

Shaul Sharon, 935 Bay Dr. #8, Miami Beach, Fla. 33141

Filed Dec. 2, 1976, Ser. No. 746,874
Int. Cl.[2] B65D *83/10*
U.S. Cl. 221—101 **8 Claims**



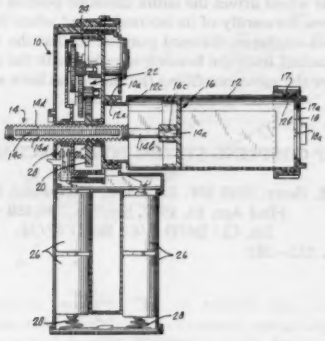
1. A combination industrial single edge razor blade dispenser and used blade receiver comprising a boxlike vertical container (10) of comparatively rigid material having a vertical blade container single compartment (12), a blade supporting floor (14) at the bottom of said compartment (12) to receive and support a stack of blades (36) thereon, a new blade ejecting slot (30) in one side wall (28) of said compartment (12) adjacent said bottom blade supporting floor (14) thereof, a subcompartment (18) beneath said blade supporting floor (14), a manually operable spring (34) resisted plunger (20) in said subcompartment (18), a blade ejector finger (26) mounted on said plunger (20) and extending up through a slot (16) in said blade supporting floor (14) and normally located against the end of the bottom blade (36) remote from said blade ejecting slot (34) on said blade compartment floor (14), a used blade inserting slot (98) in said blade receiving compartment (12) adjacent the top thereof for receiving used blades (56) in said container (10) as new blades (36) are used up, means (63) for maintaining said blade container (10) in vertical position in operative use, said vertical maintaining means comprising clothing attaching means (63) on an exterior wall (40) of said container for holding said container (10) in verticle position on the clothing of a user, and aligned slot means (84 or 90) in two opposite walls (24, 28 or 88) of said container (10), a new blade and used blade divider (76 or 92) in said compartment (12), said divider having manually manipulatable protrusions (80 or 96) extending through said opposite aligned positioning slots (84 or 90) for positioning said blade divider in said compartment (12).

4,114,781

HAND-HELD, BATTERY-OPERATED DECORATIVE EXTRUDER FOR COOKIE DOUGH AND SIMILAR FOOD SUBSTANCES

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Jun. 6, 1977, Ser. No. 803,856
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—326 **2 Claims**



1. A hand-held, battery-operated decorative extruder for dough or another cream- or paste-like food substance for making cookies, food decorations and the like comprising:

a tube having a front end and a back end spaced apart along the tube axis, a pusher closely fitting inside the tube and moveable along the tube axis and a drive screw detachably secured to the pusher and extending back from the pusher along the tube axis, said tube and pusher having cooperating means for substantially preventing relative rotation between them about the tube axis and said drive screw and pusher similarly having cooperating means for substantially preventing relative rotation between them about the tube axis;

a housing and cooperating means at the housing and the tube for detachably securing the back end of the tube to the housing, a gear wheel having an internally threaded central opening and mounted in the housing, coaxially with the tube axis, for rotation about said axis, said housing and back end of the tube having apertures to permit the drive screw to extend therethrough and through the threaded central aperture of the gear wheel, and said drive screw having an externally threaded back portion meshing with the internal thread of the gear wheel and a reduced diameter front portion which passes through the central opening of the gear wheel without engaging the threads thereof, said reduced diameter front portion of the drive screw being longer than the minimum distance between the back end of the gear wheel thread and the pusher, said drive screw having no portion which cannot pass through the internally threaded aperture of the gear wheel, and the distance between the front end of the pusher and the back end of the threaded portion of the drive screw being less than the distance between the maximum forward position of the front end of the pusher and the front end of the internal thread of the gear wheel;

an electrical motor, at least one battery, switch means for energizing the motor by connecting the at least one battery thereto and means connecting the motor to the gear wheel to rotate the gear wheel about the tube axis when the motor is energized so as to move the drive screw forwardly, all mounted in the housing; and

means at the front end of the sleeve having a selected extruding aperture;

whereby the pusher is moved back to its minimum distance from the gear wheel, the tube ahead of the pusher is filled with the food substance to be extruded, the front portion of the drive screw is inserted nonrotatably through the

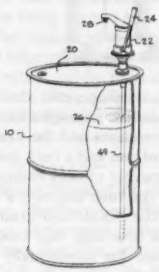
internally threaded aperture of the gear wheel and secured detachably to the pusher, the motor is energized to rotate the gear wheel and the drive screw is pushed forwardly to mesh its external thread with the internal thread of the gear wheel, the rotating gear wheel drives the nonrotating drive screw forwardly along the tube axis to move the pusher forwardly and thus extrude the substance through the extruding opening at the front end of the tube, and the gear wheel drives the entire threaded portion of the drive screw forwardly of its internal thread when the pusher is at its maximum forward position so that the tube can be detached from the housing together with the drive screw after the substance filling the sleeve has been so extruded.

4,114,782

PUMP COUPLING SYSTEM FOR ATTACHMENT TO DRUM

Harry E. Berry, 3510 SW. 32nd Ave., Hollywood, Fla. 33023

Filed Apr. 11, 1977, Ser. No. 786,350
Int. Cl.[2] B67D *5/42*; B65D *47/34*
U.S. Cl. 222—382 **4 Claims**



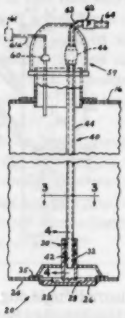
1. A liquid dispensing system comprising drum means, said drum means having an upper end wall, a female coupling means essentially permanently mounted in said upper end wall, suction tube means extending from said female coupling means downwardly adjacent the lower end of said drum, a male connector member having a mating portion insertable in sealing relationship to said female coupling means, rotary retaining means on said male connector member effective for maintaining said male connector member in coupled relation to said female coupling means, selectively operable pump means connected to said male coupling member to communicate with said suction tube when said male connector member is mounted in said female coupling whereby operation of said pump means when said male connecting member is coupled to said female connecting member results in the dicharge of liquid from the interior of the drum, wherein said female coupling member comprises an elongated tubular fitting including a central passageway communicating with said suction tube, an upper radial flange, a threaded external cylindrical surface on said tubular fitting positioned beneath said upper radial flange dimensioned to be threadably connected to a threaded opening in the upper end wall of said drum means and said central passageway extending through said head flange and being dimensioned to receive said male connector member, said central passageway including an inner radially extending arcuate groove beneath said head flange and wherein said head flange additionally includes radially outwardly extending groove slots on opposite sides of the upper end of said central passageway in said head flange and wherein said male connector member includes radially outwardly extending lugs having outer dimensions slightly less than the dimensions of said groove slots and being of a vertical thickness slightly less than the thickness of said inner radially extending arcuate groove of said tubular fitting whereby said lugs can be moved downwardly through said groove slots and subsequently rotated to position said lugs in said arcuate groove for maintaining said male connector member in coupled connection to said female connector member and wherein said male connector member comprises a unitary tubular member comprising a reduced diameter bottom portion, an upper coupling head portion having an internal threaded surface threa ed onto said pump, an internal passageway extending the length of said unitary tubular member, a check valve in the lower end of said internal passageway for preventing flow from said internal passageway and seal means on said reduced diameter bottom portion engageable with said central passageway when said male connector member is mounted in said female coupling means to define a continuous flow path from said suction tube to said pump.

4,114,783

EDUCTION PIPE WITH GUIDE SLEEVE AND SEAL TO DRAW LIQUID FROM THE BOTTOM AND ALLOW TELESCOPING WHEN TANK TOP MOVES DOWN UNDER IMPACT

Richard J. Wempe, and Richard B. Polley, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,129
Int. Cl.[2] B61D *5/00*; B65D *83/14*
U.S. Cl. 222—398 **13 Claims**



1. A sump and eduction arrangement for a railway tank car comprising:

a low profile sump located in an opening in the bottom of the tank and extending a short distance below the outside of said tank bottom; said sump including a sump hollow portion to collect lading for unloading;

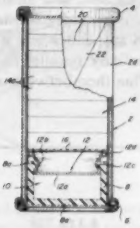
an eduction pipe located above said sump including a fixed eduction pipe portion supported on said tank bottom including a hollow tube extending into said sump hollow portion, and a movable eduction pipe portion including a lower tubular portion telescopicly engaging said fixed eduction pipe portion and vertically movable relative to said fixed eduction pipe portion and an upper tubular portion extending to the upper portion of the tank; valve means for opening and closing communication between said eduction pipe and the outside of the tank; means for providing a pressure differential between said valve means and said sump whereby lading passes into said sump and then upwardly through said fixed eduction pipe portion and said movable eduction pipe portion and out of said tank, and whereby when the upper portion of said tank moves downwardly relative to the tank bottom said movable eduction pipe portion and said fixed eduction pipe portion telescope relative to one another during such downward movement.

4,114,784

COMPARTMENTED COMPOSITE CONTAINER INCLUDING A SNAP-FIT SEPARATOR MEMBER

Robert J. Hough, Ballwin, and John E. Bacon, St. Charles, both of Mo., assignors to Boise Cascade Corporation, Boise, Id.

Filed Apr. 1, 1977, Ser. No. 783,788
Int. Cl.[2] B65D *25/04, 85/36*
U.S. Cl. 220—408 3 Claims



1. A compartmented composite container, comprising

(a) a composite tubular body wall including a fibrous body wall layer and an impervious inner liner layer, the inner cylindrical circumferential surface of said body wall being uniform throughout its length;

(b) an end closure member connected to close one end of said body wall;

(c) a cylindrical open-ended synthetic plastic cup member arranged concentrically within said body wall with the bottom of said cup member seated on said end closure member, the outer diameter of said cup member corresponding generally with the inner diameter of said tubular body wall, thereby to permit said cup member to be slidably inserted within said tubular body wall, the open top end of said cup member including an upper end surface spaced from the other end of said tubular body wall;

(d) a rigid metal separator member closing the upper end of said cup member, whereby said cup member and the space between said separator member and the other end of said tubular body member are adapted to contain first and second products, respectively, separated by said separator member, said separator member including

(1) a central circular disk-shaped portion arranged transversely within the open top end portion of said cup member,

(2) a cylindrical neck portion which extends longitudinally upwardly through the open upper end of said cup member; and

(3) a generally outwardly extending annular flange portion,

(4) said flange portion terminating at its outer peripheral edge in a reversely curled portion; and

(e) means defining a snap-fit connection between said separator neck portion and the upper end of said cup member, thereby to define a first pair of abutting sealing surfaces for separating the container products;

(f) the outer diameter of said separator flange portion corresponding with the inner diameter of the tubular body wall to effect frictional engagement between said flange portion and said body wall inner surface, thereby to define a second pair of abutting sealing surfaces for separating the container products;

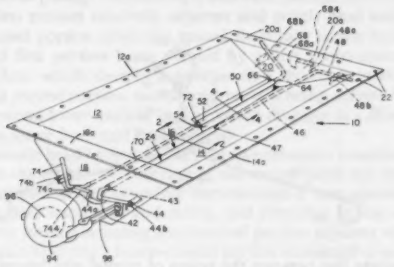
(g) the reversely curled separator portion being in contiguous engagement with the upper end surface of said cup member, thereby to define a third pair of abutting sealing surfaces for separating the container products.

4,114,785

CONTROL VALVE FOR BOTTOM DISCHARGE OUTLET

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,892
Int. Cl.[2] B61D *7/02;* B65G *53/40*
U.S. Cl. 222—545 38 Claims



3. A container outlet for use on railway cars, overland hopper trucks and/or intermodel containers comprising:

at least one wall having an opening in the lower portion thereof defining an outlet discharge opening; a control valve rotatably mounted within said discharge opening; said control valve including a body portion having a body portion longitudinal axis of rotation and a body portion edge which in closed position engages, or is closely adjacent to, a body portion valve seat located on a first side of said discharge opening to substantially prevent lading discharge; said control valve further including a moment portion extending transversely and eccentrically from said body portion, said moment portion having a moment portion edge which in closed position engages or is closely adjacent to, a moment portion valve seat located on a second side of said discharge opening to substantially prevent lading discharge; said control valve moment portion extending eccentrically from said body portion a distance sufficient to define a moment portion moment arm about said body portion axis; said body portion being contoured such that lading forces due to gravity acting on the body portion on either side of said axis are generally balanced, resulting in little tendency to rotate the control valve in either direction; the combination of said moment portion moment arm and the force of gravity acting on the lading to be unloaded applied upon said moment portion creating a moment about said body portion axis; said moment tending to reduce the torque required to rotate said control valve into said open position; said control valve being rotatably movable between said closed position and an open position wherein lading may pass out of said outlet through said discharge opening during unloading.

4,114,786

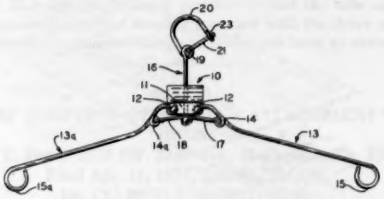
GARMENT HANGER

Harold Wiese, North Highland, Box 236, Madison, S. Dak. 57042

Filed Aug. 3, 1977, Ser. No. 821,513
Int. Cl.[2] A47J *51/11*
U.S. Cl. 223—94 9 Claims

1. A garment hanger comprising a body member, a pair of arms each of which is pivotally attached at its one end to said body member, one of said arms extending to one side of said member and the other of said arms extending to the other side of said member, a vertical stem extending downwardly and being slideably engaged with said member, a pair of links one of which is pivotally attached at its one end with one of said arms at a point spaced from the pivoted end of said one arm and having its other end pivotally attached to the lower end of

said stem and the other of said pair of links having its one end pivotally attached to the other of said arms at a point spaced from the pivoted end of said other arm and having its other end pivotally attached to the lower end of said stem, whereby when said stem is moved downwardly of said member said links operate to bring said arms downwardly and toward each other and when said stem is moved upwardly of said member said arms are moved upwardly away from each other, said stem being movable upwardly of said member beyond a



straight line between the points of pivotal attachment of said links with said arms, and stop means for limiting further upward movement of the lower end of said stem after said stem has been moved upwardly to a predetermined position above said line, whereby when said stem is in said predetermined position, said arms are locked against downward movement about their pivots, one of said links having its shank rearward of said stem and the other of said links having its shank forward of said stem.

4,114,787

SHEATH FOR KNIFE WITH DEAD BLADE

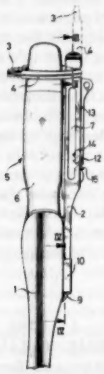
Siegfried Rosenkaimer, Solingen, Fed. Rep. of Germany, assignor to Ruko of Canada Ltd., Mississauga, Canada

Filed Oct. 21, 1977, Ser. No. 844,161

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 7633910

Int. Cl.[2] B26B *29/02;* F41B *13/04*

U.S. Cl. 224—2 D **2 Claims**



1. A sheath for a kinfe with a dead blade such as a hunting knife, a Bowie knife or the like, comprising:

(a) a quiver for retaining the blade of a knife,

(b) an elongated suspender secured to said quiver and arranged for attachment to a body belt, and

(c) an annular retainer pivotally secured to said suspender and adapted to be pushed over the handle of said knife to secure said knife in said quiver,

(d) said quiver including a U-shaped bridge at the rear side thereof,

(e) said suspender being bevelled at one end thereof and including a recessed area extending across the width thereof adjacent said bevelled end whereby said suspender may be inserted between said U-shaped bridge and the rear side of said quiver and locked in position with said U-shaped bridge passing over said recessed area of said suspender.

(f) said suspender defining a notch therein adjacent the opposite end thereof for resiliently and pivotally securing said annular retainer, and

(g) said suspender further including means defining an elongated slot between said recessed area and said notch for receiving said body belt, said means comprising an upper arm projecting downwardly substantially parallel to and spaced from said suspender and a lower arm projecting upwardly substantially parallel to and spaced from said suspender to define therebetween said slot.

4,114,788

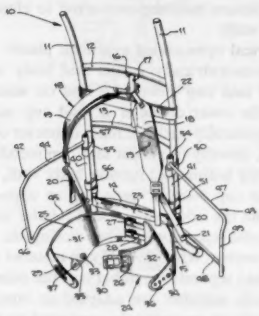
FRONT LOAD CARRYING APPARATUS FOR BACKPACKS

Anthony C. Zufich, P.O. Box 333, Bodfish, Calif. 93205

Continuation-in-part of Ser. No. 690,068, May 26, 1976. This application Aug. 1, 1977, Ser. No. 820,741

Int. Cl.[2] A45F *3/10*

U.S. Cl. 224—25 A **9 Claims**



1. A backpack and frame apparatus including a pair of frame members for supporting a rear load comprising:

(a) hip belt means for encircling the waist of the user, said hip belt means including downwardly depending panels adapted to lie along the hips of the user, each of said panels including coupling means for attachment thereto;

(b) means for coupling said downwardly extending panels of said hip belt means to the backpack and frame;

(c) a pair of front support load arms each comprising first and second parallel legs being integrally joined at one end thereof, said first and second legs being uniformly curved toward the joined end of said support load arm;

(d) locking means for supporting a frontal, auxiliary load coupled to said front support arms;

(e) first and second shafts having parallel apertures disposed therethrough, the first and second legs of each of said front support load arms being disposed through a pair of apertures of one of said shafts;

(f) means for securing the legs of each of said front support load arms within one of said shafts respectively; and

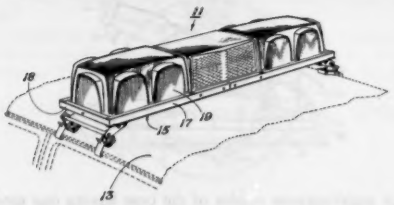
(g) means for pivotally coupling each of said first and second shafts to a lateral frame member whereby the joined ends of said first and second front support arms can be pivoted adjacent one another.

4,114,789

MOUNTING APPARATUS FOR VEHICLE EMERGENCY WARNING SIGNAL

Arnold O. Blaylock; Robert P. Falconer, and Charles M. Campbell, all of Fort Worth, Tex., assignors to Lectric Lites Company, Fort Worth, Tex.

Filed Apr. 14, 1977, Ser. No. 787,552
Int. Cl.[2] B60N *11/00*
U.S. Cl. 224—42.1 E 3 Claims



1. In a warning signal apparatus for mounting on the roof of a vehicle of the type having a frame including a metal rim, and signal light means mounted on opposite sides of the frame, an improved means for mounting the warning signal apparatus to the vehicle, comprising:

a pair of spaced apart brackets attached to the rim on each side of the warning signal apparatus, each bracket having an outer end portion extending below the rim and outward with an aperture therethrough;

a rod extending between the outer ends of the bracket on either side, the rod having threaded holes in its ends adapted to align with the apertures in the bracket outer ends;

a resilient pad with an upstanding metal flange having an aperture therethrough that is adapted to align with the aperture in the outer end of each bracket, the rod, brackets, and flanges being coupled together by a screw threaded into the ends of each rod, whereby loosening the screw allows the pad to be pivoted for selectively seating the pad on a sloping portion of the vehicle roof;

a clip having catch means for engaging the edge of the roof of the vehicle; and

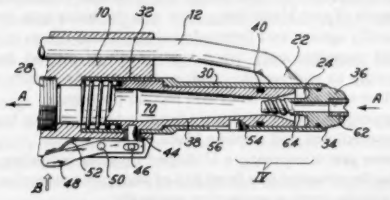
adjusting means linking the clip with the bracket for varying the distance between the bracket and the clip to tighten the frame to the roof.

4,114,790

DEVICE FOR CAPTURING AND REMOVING TEXTILE YARNS, BY SUCTION AND PNEUMATIC ENTRAINING

Pierluigi Sighieri, Scarperia, and Gianfranco Colleoni, Castelmonte, both of Italy, assignors to UTITA S.p.A. Officine e Fonderie di Este, Milan, Italy

Filed Apr. 18, 1977, Ser. No. 788,636
Claims priority, application Italy, Apr. 23, 1976, 22592 A/76
Int. Cl.[2] B65H *17/32*
U.S. Cl. 226—91 12 Claims



1. A device for initially picking up and then removing textile yarns, said device comprising:

a hollow casing having first and second ends;

a nozzle head fixedly attached to said first end of said casing;

an outlet tube in communication with said second end of said casing;

a movable sleeve slidably positioned within the interior of said casing, said sleeve being axially slidable within said casing between a foremost first position relatively adjacent said nozzle head and a rearmost second position relatively spaced from said nozzle head, said sleeve having an axial passage therethrough, said axial passage including a first portion relatively adjacent said nozzle head and a second portion relatively spaced from said nozzle head, said first portion being defined by a first frusto-conical surface which sharply converges in a direction toward said second portion, said second portion being defined by a second frusto-conical surface which diverges in a direction away from said first portion;

said nozzle head having a fixed tube-like extension extending into the interior of said casing, said nozzle head and said extension having extending therethrough a bore opening into said interior of said casing, said extension having an outer surface including a cylindrical portion adjacent said nozzle head and a frusto-conical portion connected to said cylindrical portion and converging radially inwardly in a direction away therefrom, said frusto-conical portion ending in a nozzle outlet;

said extension extending into said passage of said sleeve and defining therewith an annular passage;

said nozzle head and the adjacent end of said sleeve defining therebetween a chamber, said chamber coaxially surrounding said extension and communicating with said annular passage;

said sleeve, when in said first position thereof, cooperating with said extension such that said annular passage comprises an initial convergent segment and a final divergent segment, said initial convergent segment being defined by said cylindrical surface of said extension and said first frusto-conical surface of said sleeve, and said final divergent segment being defined by said frusto-conical portion of said extension and said second frusto-conical surface of said sleeve;

said sleeve, when in said second position thereof, cooperating with said extension such that said nozzle outlet is located at a position between the opposite axial ends of said first frusto-conical surface of said sleeve, and such that said annular passage is completely convergent and is defined by said frusto-conical portion of said extension and said first frusto-conical surface of said sleeve; and

means for supplying pressurized gas into said chamber, such that when said sleeve is in said first position thereof a relatively small quantity of gas passes from said chamber through said annular passage at a relatively high pressure, thus creating a reduced pressure in said bore so that a yarn may be picked up and drawn therethrough, and such that when said sleeve is in said second position thereof a relatively greater quantity of gas passes from said chamber through said annular passage at a relatively lower pressure, thus pulling the picked up yarn through said passage of said sleeve and into said outlet tube, while substantially avoiding the creation of a reduced pressure in said bore.

4,114,791

FEEDING MECHANISM

Georg Schneider, Ludwigkai 27, Wuerzburg, Fed. Rep. of Germany (D-8700)

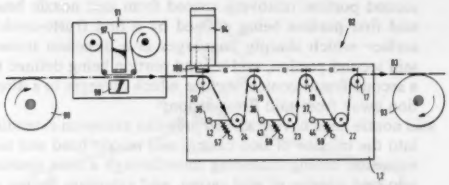
Filed Aug. 19, 1977, Ser. No. 826,215
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637248
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—91 4 Claims

1. A feeding mechanism for continuously feeding a printed carrier material from an intermittently operating printer to a continuously operating processing or storage mechanism, said feeding mechanism comprising:

an upper horizontal row of guide cylinders secured at their ends to spaced side panels;

a movable carriage carried by guide pieces secured to said side panels;

a lower row of rotatable cylinders each said rotatable cylinder secured to a first end of a spring loaded arm, each of said arms pivotably secured at a point intermediate its ends to spaced side portions of said carriage, second ends



of said arms being guided in guide slots in said side panels; and

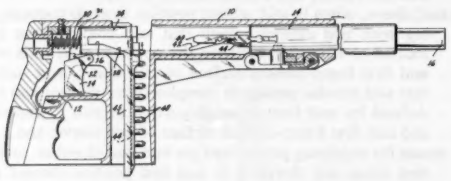
means to raise said carriage to position said rotatable cylinders above said guide cylinders during threading of said carrier material through said feeding mechanism and to lower said carriage to position said rotatable cylinders below said guide cylinders during feeding of said carrier material through said feeding mechanism.

4,114,792

POWDER ACTUATED TOOL

Raymond V. Pomeroy, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Jul. 20, 1977, Ser. No. 817,386
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—8 **4 Claims**



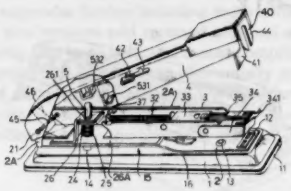
1. A tool for explosively driving elongated fasteners into work surfaces comprising; a housing, a barrel slideable in the housing between a forward and rearward position and being normally biased in its forward position and projected from the housing for engagement with a work surface, a breech block in the housing rearward of the barrel and cooperative with said barrel to form a cartridge receiving chamber, a camming ramp provided in the breech block, and a trigger mechanism including safety means that renders the trigger operable only when the barrel is forced into its rearward position, a finger member extended rearwardly of the barrel that is pivotally movable between first and second positions, and biasing means biasing the finger member into the first position and in said first position adapted to be engaged by the camming ramp to be cammed by the ramp into the second position as the barrel is forced into its rearward position, the breech block having a passage as an extension of its forward face and in cooperation with the rearward end of the barrel with the barrel in its forward position, which passage is adapted to receive a strip of cartridges, and finger member being adapted to engage the strip of cartridges and thereby move successive cartridges carried by the strip into position between the rear end of the barrel and the forward face of the breech block.

4,114,793

MULTI-PURPOSE STAPLER

Sheau-Po Hsu, Hu Wei Town, Taiwan, assignor to EIC International Corporation, Taipei, Taiwan

Filed Jun. 1, 1977, Ser. No. 802,447
Int. Cl.[2] B25C *11/00*
U.S. Cl. 227—63 **3 Claims**



1. A multi-purpose stapler of the type having one mode of operation wherein hole-punching and staple-removing functions are afforded and another mode of operation wherein a stapling function is afforded, said stapler comprising:

a base including a punch-receiving aperture at one end and a staple clinching die at another end,

supporting bracket including a front portion fixedly mounted on said base, and a rear portion spaced from said base to define a clearance for reception of material to be punched, said rear portion including a hole aligned with said aperture,

a staple magazine pivotably mounted to a rear portion of said bracket,

a press handle pivotally mounted to a rear portion of said bracket and including longitudinal slots at the middle thereof,

a pair of buttons slidably mounted in said slots,

a punching actuator connected to said buttons and disposed within said handle for movement between first and second positions,

stop means positioned on said magazine to be operably engageable with said actuator when said actuator is in said first position to limit downward movement of said handle to a first level and nonengageable with said actuator when said actuator is in said second position to allow downward movement of said handle beyond said first level to a second level,

a bearing plate mounted on a rear portion of said bracket and including a hole aligned with said aperture and said hole in said bracket,

a punch rod slidably received in said holes and biased away from said aperture,

said punch rod positioned for being depressed downwardly beyond said aperture by a contact portion of said actuator only when said actuator is in said second position, so that hole punching may occur only when actuator is in said second position,

a vertical stapling blade mounted at a front end of said press handle above a forwardmost staple in said magazine, the length of said blade being such that the blade acts downwardly against said forwardmost staple and drives it from said magazine only when said handle is moved downwardly to said second level, so that stapling occurs only when said actuator is in said second position,

an upper jaw depending from a front end of said press handle forwardly of said stapling blade,

a lower jaw comprising a U-shaped member including legs fixedly mounted to a front end of said staple magazine and a middle portion projecting upwardly,

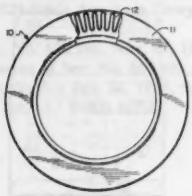
said upper jaw and middle portion being oriented to merge together and remove a staple when said press handle is lowered to said first level, so that staple removing occurs when said actuator is in said first position.

4,114,794

METHOD OF AUTOGENOUSLY BONDING FILTER ASSEMBLIES

Ronald L. Storms, Hamburg, N.J., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 10, 1977, Ser. No. 758,130
Int. Cl.[2] B23K 31/02; B01D 29/20
U.S. Cl. 228—182 10 Claims



1. A method of joining porous metallic filter media and a metal filter housing to form a filter assembly which comprises the steps of:

forming a diffusion bonding porous membrane, said membrane comprising a web of small diameter fibrils having metallurgical compatibility with both the filter media and the housing;

placing said porous membrane between and in contact with the filter media and housing to form an assembly; and

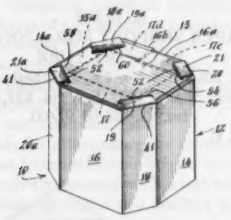
sintering said assembly at a temperature below the melting point of the membrane, filter media and housing and for a time sufficient to form a strong, leak-free autogenous bond between the filter media and the housing.

4,114,795

CORNER LOCK BULK BIN

Terence J. Mulroy, Sioux City, Iowa, assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 7, 1977, Ser. No. 858,109
Int. Cl.[2] B65D 13/04, 5/12
U.S. Cl. 229—23 R 5 Claims



1. An octagonal-shaped paperboard bulk bin comprising:

a side wall formed from opposed pairs of substantially rectangular, upstanding side panels and opposed pairs of substantially rectangular, upstanding corner panels that are alternatively, foldably connected,

each corner panel including a horizontally disposed, substantially rectangular flap foldably connected to the bottom edge thereof,

each side panel including a horizontally disposed, substantially rectangular flap foldably connected to the bottom edge thereof, and

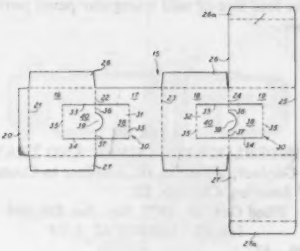
an octagonal planar sheet disposed between said opposed pairs of side panel flaps and corner panel flaps to form a bottom for said bin, said sheet including interior slots adjacent the corners thereof receiving a free end of each of said corner panel flaps therethrough to lock said side wall to said sheet.

4,114,796

CONTAINER HAVING BRACED PARTITIONS

Fred Paul Voges, Park Ridge, Ill., assignor to Consolidated Packaging, Inc., Chicago, Ill.

Filed Oct. 26, 1976, Ser. No. 735,259
Int. Cl.[2] B65D 5/48, 5/02
U.S. Cl. 229—27 8 Claims



1. A multi-celled, erectable, partitioned carton formed from a sheet-form blank, the carton comprising:

two pairs of opposite side walls connected together at parallel side fold lines;

at least one pair of partition bands severed from said side walls along upper and lower cut lines extending generally transversely to said side fold lines and each one of each said pair of bands being joined to different ones of said side walls at each opposite end of said band at band end fold lines which extend parallel to said side fold lines, each said band thereby spanning one of said side fold lines; and

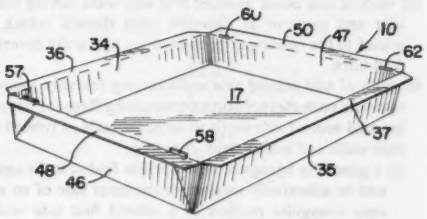
each band of each pair of bands having at least one attachment zone formed on a face thereof, each of the corresponding attachment zones of the bands of each pair being spaced equidistantly from each side fold line between the ends of the bands.

4,114,797

TRAY TYPE CONTAINER

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Sep. 26, 1977, Ser. No. 836,309
Int. Cl.[2] B65D 5/24; F65D 5/22
U.S. Cl. 229—31 R 2 Claims



1. A tray type container comprising a bottom wall forming panel, upstanding sidewall forming panels integrally hinged to the peripheral edges of the bottom wall forming panel and integral connecting corner web members joining adjacent ends of adjoining sidewall forming panels, said sidewall forming panels having narrow top flange forming panel members extending adjacent the ends of the adjoining sidewall forming panels which are adapted to be hinged into a plane generally normal to the plane of an associated sidewall forming panel, said corner connecting web members being folded so as to lie in engagement with the end marginal portions of an associated sidewall forming panel and having a locking tab extending outwardly of the outermost edge thereof which is engaged in

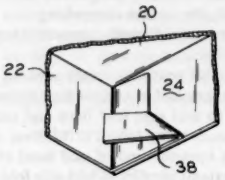
a cooperating locking aperture disposed adjacent the hinge connection of said associated sidewall forming panel and the top flange forming member which is hinged thereto, said corner connecting web members being divided into two hingedly connected generally triangular panel portions which are folded so as to be positioned in overlying relation and disposed along the outermost face of said associated sidewall forming panel, and said locking tab of each corner connecting web member bridging the fold line of said triangular panel portions of said web member.

4,114,798

INTERLOCKING COVER AND TRAY

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Oct. 28, 1977, Ser. No. 846,334
Int. Cl.[2] B65D *5/42, 5/64*
U.S. Cl. 229—43 **1 Claim**



1. In a collapsible, interlocking cover arrangement for a two-piece telescoping container, the combination of:

(a) a tray member including a bottom wall and opposed pairs of side walls foldably joined to each other and to said bottom wall and upstanding from the latter to form a box-like structure open at the top;

(b) certain of said tray member side walls including outer flange elements presenting downwardly facing abutments;

(c) a cover member including a top wall and opposed pairs of first and second side walls foldably joined to each other and to said top wall and depending from the latter to form a box-like structure open at the bottom;

(d) each of said cover member first side walls having triangular end portions at opposite ends thereof which are joined to the remaining portion along upwardly diverging fold lines;

(e) each of said second side walls having foldably joined to opposite ends thereof corner connecting flaps for connecting said second side walls to adjacent ends of related first side walls and which each comprise:

(i) a generally triangular first portion folded to lie against and be adhesively secured to the inner side of an adjacent triangular portion of a related first side wall to permit said cover to be collapsed by folding said triangular end portions of said first side walls along said diverging fold lines;

(ii) a portion projecting upwardly from said triangular section and being free from attachment to said first side wall for engagement with the underside of said top wall when said cover is in erected condition;

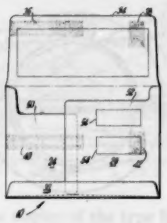
(iii) a locking tab foldably joined to a lower edge of said triangular portion and being optionally foldable on to the inner side thereof for presenting an upwardly facing abutment for engagement with a corresponding downwardly facing abutment on said tray member to provide an optional interlocking connection between said members.

4,114,799

SOLICITATION ENVELOPE CARRIER

William A. Brown, Omaha, Nebr., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 813,836
Int. Cl.[2] B65D *27/08*
U.S. Cl. 229—72 **4 Claims**



1. A solicitation envelope carrier suitable for simulataneously carrying empty and filled bulky envelopes comprising:

a front panel of generally rectangular shape having top, bottom, and side edges;

a first end panel hingedly connected to one side edge of the front panel and being less than one-half the width of said front panel, said first end panel being bonded along its edge opposite to said hingedly connected edge to the face of said front panel;

a second end panel hingedly connected to the opposite side edge of the front panel and being greater than one-half the width of the front panel, said second end panel overlapping and being bonded to said first end panel;

a bottom panel hingedly connected to said bottom edge of the front panel and overlapping and being bonded to said first and second edge panels so as to define with said front panel and said first and second end panels a small pocket and a large pocket for accomodating empty and filled bulk envelopes respectively; and

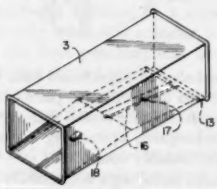
a top panel forming a flap that is hingedly connected to the top edge of the front panel.

4,114,800

NEWSPAPER SUPPORT FOR A NEWSPAPER DELIVERY TUBE

Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643

Filed Sep. 7, 1977, Ser. No. 831,178
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—1 C **3 Claims**



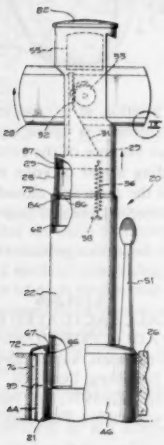
1. A newspaper support for a newspaper delivery tube of one piece, elongated, hollow body construction open at one end and closed at the other, which support comprises a surface having generally the shape of an inverted V and having a length greater than one-half the length of the tube, the upper edge of the inverted V portion of the surface being no more than about one-half the height of the tube and positioned from the open end of the tube a distance of no more than one-half the delivery tube's length, the front edge of the surface of the

support being positioned from the open end of the delivery tube a distance of no more than one-quarter of the delivery tube's length, wherein a V-shaped trough is provided along the longitudinal center of at least one side of the "V" of the inverted V-shaped surface of the support.

4,114,801
RETRACTABLE MAILBOX

John J. Van Orden, 527 Santa Ana Ave., Newport Beach, Calif. 92660

Continuation of Ser. No. 632,246, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 505,595, Sep. 12, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 761,709
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—17 **14 Claims**



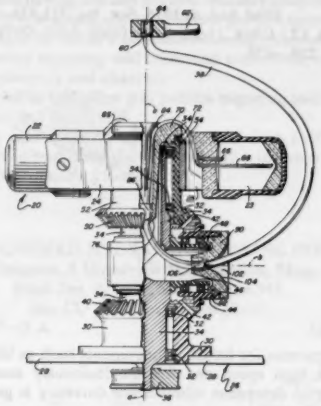
1. A retractable mailbox assembly comprising:
a hollow open ended housing recessed in the ground with the open end thereof substantially flush with the surrounding surface;
a plurality of telescopic members positioned within said housing with one of said members having a mail receiving receptacle mounted at the top thereof;
displacing means responsive to a pneumatic force for raising at least the innermost of said telescopic members a linear height to thereby enable mail to be deposited or withdrawn from said receptacle; and
retracting means for effectuating the retraction of said displacing means from said linear height, comprising a compressor operatively mounted within said mailbox assembly for compressing air within said mailbox assembly.

4,114,802
CENTRIFUGAL APPARATUS WITH BIAXIAL CONNECTOR

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 29, 1977, Ser. No. 828,476
Int. Cl.[2] B04B *9/00, 5/02*
U.S. Cl. 233—26 **11 Claims**

1. Centrifugal processing apparatus, which comprises:
a stationary base;
a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;
a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the processing chamber;
a connection member for supporting the cable segment and for minimizing stress on the cable segment;
means fastening said cable to said connection member; and

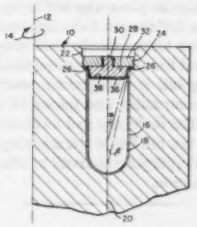


means for rotating said connection member about said predetermined axis and for rotating said connection member about another axis which is angled with respect to said predetermined axis.

4,114,803
CENTRIFUGE TUBE ENCLOSURE

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1976, Ser. No. 751,382
Int. Cl.[2] B04B *5/02*
U.S. Cl. 233—26 **15 Claims**



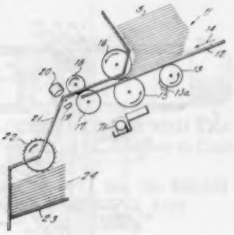
1. In a centrifuge rotor for centrifuging a sample in a resilient sample container having an open end, said rotor having a rotational axis and a radially spaced cavity with an open end and an axis through said open end generally parallel to said rotational axis for receiving said container, said open cavity end being flared, a first tapered plug, and a retainer secured to said open cavity end for wedging the walls of the open end of said container between said plug taper and said flare, the improvement of:
a resilient shell-like cap interposed between said plug and said container, said cap having a resiliency equal to or greater than that of either said plug or said container.

4,114,804

COUNTERFEIT DETECTION MEANS FOR PAPER COUNTING

Alan P. Jones, Levittown, Pa., and William Sherman, Willingboro, N.J., assignors to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Aug. 4, 1976, Ser. No. 711,436
Int. Cl.[2] G06K *13/16, 7/10;* G06F *7/02;* G07F *1/02*
U.S. Cl. 235—476 **23 Claims**



1. Apparatus for handling documents such as bills and currency at high speed and for simultaneously examining the currency to determine whether the currency is genuine or is suspect comprising:

a feed tray for receiving a stack of documents to be counted and tested;

first means cooperating with the feed tray for advancing each document from the feed tray in a one-at-a-time fashion from the stack thereby advancing the documents in a forward feed direction said first means operating continuously during a normal document handling operation;

second means for receiving documents delivered from said first means to provide a gap of predetermined minimum length between adjacent edges of successive documents, said gap length being measured in the feed direction;

third means responsive to the forward edge of each bill for generating a count signal, said signal having an interval equal to the time required for the bill to pass said third means;

means for stacking the bills delivered thereto by said second means;

a light source for illuminating bills as they pass the light source;

fluorescence detection means for examining said documents as they pass through said first means and adapted to generate a suspect signal when the bill being examined fluoresces under the influence of the light source;

feed control means responsive to said suspect signal and to said count signal for abruptly halting said first means once the fluorescing bill is engaged by said second means to prevent further counting and testing of documents which may yet be in the feed tray and to assure that the suspect bill will be the last bill fed to the stacking means to thereby facilitate simple, rapid removal of the suspect bill for further examination.

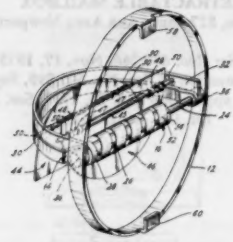
4,114,805

THERMAL DAMPER ASSEMBLY

Wesley G. Humphreys, 1070 Randolph Rd., Meadowbrook, Pa. 19046, and Edward Camillo, 20 South Michigan Ave., Atlantic City, N.J. 08401

Filed Feb. 9, 1977, Ser. No. 767,065
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—1 G **21 Claims**

1. A damper assembly for conserving fuel consumption in a furnace comprising baffle means and support means in which said baffle means is located, said support means being arranged to be connected to an outlet flue communicating with the furnace such that the baffle means is located within the flow path of combustion gases through the flue, said baffle means being pivotally mounted to said support means for movement between an open position wherein the flow path through the flue is generally unimpeded and a closed position wherein a restricted flow path through the flue is provided, control means responsive to the temperature of the gases in the flue for moving said baffle means to the open position at a relatively low temperature indicating that the furnace is not operating



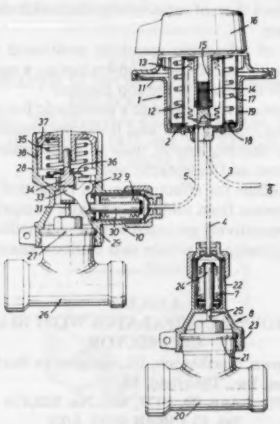
and to its closed position at a relatively high temperature indicating that the furnace is operating whereby heat is retained in the furnace because of the restricted flow path, said baffle means including a pair of yoke members mounted for movement between the open and closed positions and louvre means pivotally carried by each of said yoke means.

4,114,806

THERMOSTATICALLY ACTUATED REGULATOR FOR A 4-LEAD AIR CONDITIONING PLANT

Niels Peter Grand Graversen, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 27, 1977, Ser. No. 791,480
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619413
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—1 C **6 Claims**

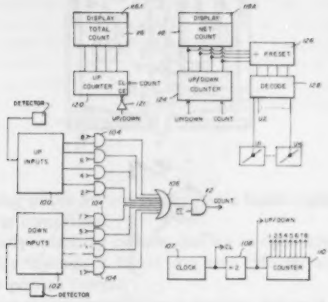


1. A thermostatic control system for cooling and heating, comprising, a cooling valve, a heating valve, a fluid pressure controlled operating element for each of said valves, common sensor means and common variable chamber setting means for said system, capillary tube means connecting said operating elements to said sensor means and said setting means, an expansion fluid in said system, and resilient means biasing at least one of said valves in a closing direction to provide an operationally dormat dead zone.

4,114,807
CONTROL SYSTEM

Melvin L. Naseck, Peabody, and Mark R. Hickman, Somerville, both of Mass., assignors to Conservation Controls Corp., Boston, Mass.

Filed Mar. 23, 1976, Ser. No. 669,647
Int. Cl.[2] F24F *11/00*
U.S. Cl. 236—1 E 15 Claims

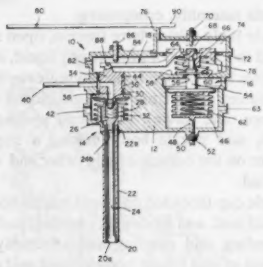


1. A method of controlling the operation of a plurality of controllable devices that are each thermostatically controlled and include means for initiating a demand and means for operating each device, said method comprising;
storing an indication of each device that is demanding,
operating only a predetermined number of devices less than the plurality of demanding devices,
storing an indication of each device that has demanded but is inhibited from operation,
sensing an operating device being satisfied and terminating operation of the device,
and terminating operation of the longest running device when a unit indicated as being inhibited has been in the inhibited state a preselected period of time.

4,114,808
PRESSURE BIASED PNEUMATIC THERMOSTAT

B. Franklin Saylor, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 13, 1976, Ser. No. 704,895
Int. Cl.[2] G05D *23/08*
U.S. Cl. 236—87 2 Claims

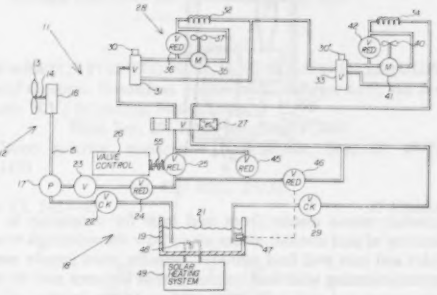


1. A sensor for varying a pneumatic signal in response to variations in temperature beyond a threshold value variable in response to changes in ambient pressure, said sensor comprising:
movable seat means having a passage communicating with a source of pressurized fluid;
ball means for engaging an end of said passage for maintaining pressure therein;
thermostat means responsive to variations in temperature for moving said ball means relative to said seat means;
aneroid bellows means responsive to variations in ambient pressure for moving said seat means relative to said ball means;
lever means having one end portion operably coupled to said movable seat means and another end portion mounted in a diaphragm to define a pressure-retaining chamber;
spring means engaging said other end portion for opposing the pressure in said chamber;
valve means in said other end portion engaging said aneroid bellows; and
means in said aneroid bellows responsive to a change in pressure stimulus for moving said valve means to release pressure from said chamber.

4,114,809
WIND POWERED HYDRAULIC HEATING SYSTEM

Arthur R. Sampson, 4 Grandview Dr., Franklin, Mass. 02038

Filed Jun. 9, 1977, Ser. No. 804,949
Int. Cl.[2] F24J *3/02*; F24C *9/00*
U.S. Cl. 237—1 A 11 Claims



1. Wind powered heating apparatus comprising:
a circulation system for hydraulic fluid;
a pump for pumping the fluid through said circulation system;
windmill means for driving said pump means;
an adjustable pressure responsive relief valve for restricting the flow of hydraulic fluid in said circulation system, said relief valve establishing an adjustable reduction of the hydraulic pressure in said circulation system;
sensing means responsive to the wind velocity encountered by said windmill means;
valve control means responsive to said sensing means for automatically adjusting said relief valve so as to establish the level of said fluid pressure reduction in dependence upon said wind velocity; and
heat exchange means for removing heat from the hydraulic fluid.

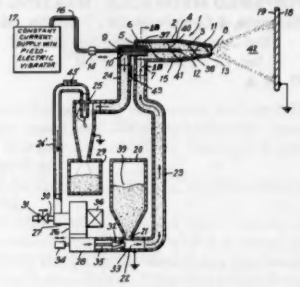
4,114,810
ELECTROSTATIC POWDER PAINTING APPARATUS

Senichi Masuda, No. 605, 1-40-10, Nishigahara, Kita-ku, Tokyo, Japan

Filed Oct. 1, 1976, Ser. No. 728,711
Claims priority, application Japan, Oct. 3, 1975, 50-119577
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—15 52 Claims

1. An electrostatic powder painting apparatus, comprising cyclone means for directing powder paint toward a surface which is to be painted, said cyclone means including a feed cyclinder having an open outlet where in a conventional cyclone separated solid particles would be collected and through which instead powder paint is adapted to be fed toward said surface and, spaced from said outlet, an inlet for receiving air

and powder paint suspended therein, said cyclone means including a whirling means operatively connected to said feed cylinder for providing for the air travelling along the interior thereof from the inlet toward the outlet a rotary whirling motion for feeding powder paint suspended in the air centrifugally along the inner surface of said feed cylinder from said inlet toward and through said outlet thereof, said cyclone means also including an exhaust cylinder of a diameter smaller than said feed cylinder communicating coaxially with the interior of said feed cylinder so that air spaced from the inner surface of said feed cylinder can flow out of the interior thereof through said exhaust cylinder, whereby the powder paint issuing from said open outlet travels therefrom toward the surface which is to be painted without the air which flows out through said exhaust cylinder, conduit means communicating with said inlet for conveying thereto air with powder paint suspended therein, air supply means communicating with said



conduit means distant from said inlet for supplying to the interior of said conduit means air to flow therethrough to said inlet and into said feed cylinder, powder paint supply means communicating with said conduit means between said air supply means and said inlet for supplying to the interior of said conduit means powder paint to be suspended in air flowing along the interior of said conduit means, so that the portion of said conduit means extending from said powder paint supply means to said inlet and said feed cylinder provides for the powder paint a path of flow extending along the interior of said conduit means from said powder paint supply means to said inlet and from said inlet through the interior of said feed cylinder through and at least slightly beyond said outlet of said feed cylinder, and charging means situated at the region of said path of flow for electrostatically charging the powder paint travelling along said path of flow with unipolar ions for driving the charged powder paint electrostatically toward the surface to be painted so as to become deposited thereon.

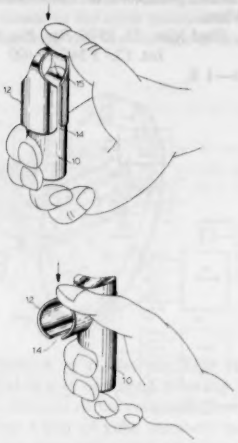
4,114,811

SPRAY DISPENSER WITH EASILY ACTUABLE MOUTHPIECE

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,945
Int. Cl.[2] A61M *15/00*; B05B *1/28*
U.S. Cl. 239—288.5 **3 Claims**

1. In combination, a dispenser for dispensing a spray of a liquid material and having a cylindrical container with a nozzle adjacent one end thereof directed generally at a right angle to the longitudinal axis of the container, and an actuator on the container for actuating the dispenser for dispensing the spray through the nozzle, and a mouthpiece of a resilient material and having a cylindrical portion having an inner cross-sectional shape the same as the external cross-sectional shape of the container and having a slit therein parallel to the longitudinal axis thereof and a loop across one end thereof extending transversely to a diametral line from the slit to the other side of said cylindrical portion, pivot means connected between the point on said cylindrical portion of said mouthpiece at the opposite end of said diametral line and the end structure of the container at the end adjacent which said nozzle is located and



on a line parallel to the longitudinal axis of the container through said nozzle, the nozzle being located inwardly along the container from the position of said pivot means a distance substantially half the diameter of the cylindrical portion.

4,114,812

SPRAY NOZZLE

Forrest L. Austin, Brooklyn Center, and Richard T. Cornelius, Minnetonka, Minn., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Division of Ser. No. 629,757, Nov. 11, 1975, Pat. No. 4,070,725.
This application Dec. 16, 1976, Ser. No. 751,207
Int. Cl.[2] B05B *11/00*
U.S. Cl. 239—492 **3 Claims**

1. A nozzle assembly, comprising:

(a) a nozzle body with a bore therein, open at one end to be coupled to a source of pressurized liquid, and closed at the other end, said nozzle body having external threads, having a diametral aperture near said closed end intersecting said bore, and having peripheral sealing means at said threads, said nozzle body having a cup-like discharge chamber on the outside of said other end which is radially apertured;

(b) a nozzle cap threaded onto said nozzle body and coacting with said seal, and having an opening, and an annular seat surrounding said opening and selectably engaging said other end of said nozzle body around said discharge chamber; and

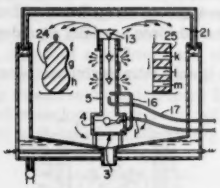
(c) a one-piece extension tube selectably disposed directly between said nozzle body and said nozzle cap, one end of said extension tube being internally threaded to be interchangeable with said nozzle cap, there being an internal clearance for preventing engagement with said other end of said nozzle body, the other end of said extension tube being a further body portion corresponding in structure to that of said nozzle body for carrying said nozzle cap.

4,114,813

THREE-DIMENSIONAL ATOMIZING SPRAY TOWER

Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,325
Int. Cl.[2] G01N *17/00*; B05B *1/00*
U.S. Cl. 239—500 25 Claims



1. A spray tower for use in spraying a liquid material, said spray tower comprising:

a vertically extending cylinder having an open upper end;

means for injecting a liquid into said cylinder adjacent a lower portion thereof;

means for atomizing said liquid injected into said cylinder and for passing the thus atomized liquid upwardly through said cylinder toward said open upper end thereof;

said cylinder having ports extending therethrough in at least one position intermediate said open upper end and said atomizing means;

deflector means, mounted above said open upper end of said cylinder, for deflecting outwardly atomized liquid exiting from said open upper end; and

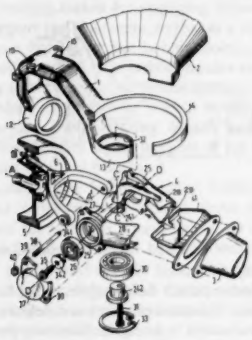
directing means, mounted within said cylinder adjacent said ports, for directing a portion of the atomized liquid passing upwardly through said cylinder outwardly through said ports.

4,114,814

AGRICULTURAL IMPLEMENT

Pieter Adriaan Oosterling, Nieuw-Vennep, and Antoine Marinus René Baecke, Hoofddorp, both of Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Division of Ser. No. 582,978, Jun. 2, 1975, Pat. No. 4,083,257.
This application Feb. 10, 1977, Ser. No. 767,455
Claims priority, application Netherlands, Jun. 4, 1974, 7407517; Jun. 4, 1974, 7407518; Jun. 4, 1974, 7407516
Int. Cl.[2] A01C *3/06*
U.S. Cl. 239—689 16 Claims



1. An agricultural implement comprising a distributor for fertilizer and the like, comprising in combination:

a frame adapted to be attached to a powered vehicle and a hopper on said frame, said hopper having a bottom opening and said frame including support means located below and to one side of said opening;

a tool support journalled in said support means about a generally vertical axis and a spreading pipe having an inner end portion disposed in horizontally spaced relation from said axis toward said bottom opening of the hopper and extending therefrom generally horizontally away from said axis to terminate in an outer end portion from which fertilizer and the like is discharged, said inner end portion of the spreading pipe defining an upwardly facing material-receiving opening immediately below said bottom opening of said hopper; and

drive means for rapidly oscillating said tool support relative to said frame about said axis whereby to whip said outer end portion of the spreading pipe back and forth to broadcast material over the ground surface;

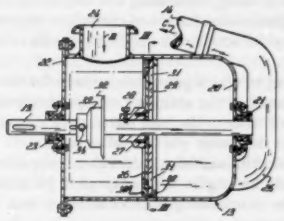
both said bottom opening and said material-receiving opening as well as said inner end portion of the spreading pipe being located in spaced relation to and to the same side of said axis whereby all material passing through said bottom opening and said material-receiving opening into said material-receiving portion is subjected to centrifugal force which causes such material to be discharged outwardly through said outer end of the spreading pipe.

4,114,815

APPARATUS FOR CONNINUTING SOLIDS IN LIQUIDS

Roelof Gijsbers, Rozendaal, Netherlands, assignor to C. van der Lely N.V., Maaslano, Netherlands

Filed Sep. 29, 1976, Ser. No. 727,808
Claims priority, application Netherlands, Sep. 29, 1975, 7511421
Int. Cl.[2] B02C *23/38*
U.S. Cl. 241—45 27 Claims



1. An implement of the kind set forth for treating the solid constituents of a manure slurry to be distributed on or into the soil which comprises a cutting mechanism, said mechanism being at least partially enclosed by a casing of substantially right circular cylindrical configuration and comprising a cutter arranged to cooperate movably with an apertured counter blade mounted in said casing, said movable cutter extending from a fastening means therefor to a location proximate the inner surface of said casing and cooperating throughout at least a greater part of its length between said fastening means and said location with the apertures provided in said counter blade, said movable cutter being arranged to rotate about an axis substantially coincident with the axis of said casing during operation of the implement, said counter blade occupying a fixed position in said casing and being disposed downstream of said movable cutter with respect to the intended direction of flow of said slurry through said casing when the implement is in operation, said movable cutter being a blade of elongate configuration and comprising two operative portions which are located at opposite sides of its axis of rotation, each of said operative portions extending to a said location proximate the inner surface of said casing whereby said locations and said axis of rotation of said movable cutter are disposed in relative positions whereby they are interconnected by a single straight line, a locking element being arranged proximate said inner

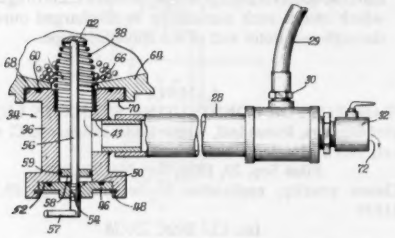
surface of said casing which functions to maintain said movable cutter at substantially a predetermined distance measured lengthwise along its axis of rotation relative to said casing, an inlet and an outlet for said slurry provided in said casing with said cutter and said counter blade arranged between said inlet and said outlet whereby all slurry passing through said casing is subjected to the operation of said cutting mechanism, distributing means for distributing said slurry producing a pressure difference between said inlet and said outlet of said casing when the implement is in operation.

4,114,816

APPARATUS FOR DISPERSING FINELY DIVIDED SOLID PARTICLES IN A LIQUID VEHICLE

George R. Schold, 7909 2nd St. North, St. Petersburg, Fla. 33702

Filed Mar. 29, 1976, Ser. No. 671,617
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.11 **13 Claims**



1. Apparatus for deagglomerating and dispersing solid particles held in agglomerated form and carried in suspension in a liquid vehicle by the action of a dispersing media on the solids comprising:

a mixing vessel in which provision is made for the particles to be subjected to the action of a dispersing media while being forced to flow through the interior of said vessel;

a fluid inlet at the lower end of said vessel;

a valve disposed in said inlet, said valve comprising,

a valve body having an inlet adapted to be connected to means for introducing a fluid mixture into said inlet under pressure;

means defining a bore in said valve body, one end of which defines an outlet from said valve body, and said valve body inlet communicating with said bore;

a compression coil spring, with coils tightly positioned adjacent each other, disposed in said valve body outlet, said coil spring being openable in response to liquid pressure acting on plate means attached to and closing the outer end of said coil spring; and

an actuating pin mounted in said valve body for longitudinal movement along its axis in said bore and

adapted to be urged against said plate means for expanding said spring to permit liquid mixture to drain from said vessel through said coil spring.

4,114,817

GRANULATOR

Fred A. Harris, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed May 16, 1977, Ser. No. 797,163
Int. Cl.[2] B02C *13/13*
U.S. Cl. 241—73 **3 Claims**

1. In a granulator having:

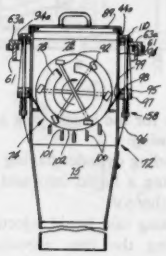
a. a housing means, having an entrance and an exit, for defining a granulation zone therewithin;

b. screen means, adapted to be attached to said housing, for dividing said granulation zone into an inlet region and an outlet region;

c. contactor means for repeatedly moving within said inlet zone and toward said screen means so as to contact a portion of any material within said inlet region and exert a force on said portion so as to tend to move said portion through said screen means and into said outlet region, and

d. retractor means, attached to said housing means, for moving said screen means away from said contactor means responsive to said force reaching a predetermined magnitude,

the improvement in said retractor means wherein:



a. said housing means includes an upper housing and a lower housing;

b. said contactor means is supported by said upper housing independently of said lower housing;

c. said screen means is supported by said lower housing; and

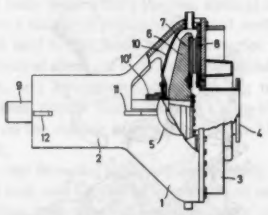
d. said retractor means includes spring means, lying between parts of said upper and lower housings, for yieldably biasing said lower and upper housings toward one another and allowing limited separation of said upper housing from said lower housing when said force reaches said magnitude and for automatically rejoining said upper and lower housings when said force falls below said magnitude.

4,114,818

DISK REFINER

Ilmari Paakkinen, Nojanmaa; Seppo Häkkinen, and Jouni Matula, both of Savonlinna, all of Finland, assignors to Enso-Gutzeit Osakeyhtio, Helsinki, Finland

Filed Apr. 14, 1977, Ser. No. 787,436
Claims priority, application Finland, Apr. 15, 1976, 761050
Int. Cl.[2] B02C *7/11*
U.S. Cl. 241—244 **4 Claims**



1. A disk refiner adapted to be supported on a mounting base, comprising:

a first rigid frame part, a deformable resilient housing which is adapted to withstand pressure and deform in response to pressure variations in order to distribute pressure therein, said deformable housing being attached at its periphery to said first frame part;

a rotatable shaft extending into said deformable housing;

a disk having refiner plates thereon attached to one end of the shaft within said deformable housing;

an end plate secured to said first frame part adjacent said deformable housing and having plates thereon serving as stationary counter plates for said refiner plates on said disk;

sleeve means mounted on the shaft and connected to said housing for forming a gasket between the shaft and deformable housing; and

a second rigid frame part including bearing means for supporting the shaft therein, said first and second frame parts constituting for the refiner a uniform uninterrupted frame having the shape of a hollow body of revolution and serving as a guide and support for the refiner shaft and said bearing means, said uninterrupted frame having fixation points thereon located symmetrically about the frame with respect to the shaft for supporting the refiner on its base.

4,114,819

APPARATUS FOR SUPPORTING A BOBBIN HOLDER SHAFT IN A HIGH SPEED WINDER

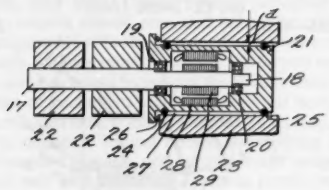
Hiroshi Kanki, Kakogawa; Kazuyoshi Yasuda, and Hisashi Tatsuke, both of Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1976, Ser. No. 723,052

Claims priority, application Japan, Sep. 25, 1975, 50-114918

Int. Cl.[2] B65H *54/44*

U.S. Cl. 242—18 R **2 Claims**



1. For a bobbin holder having a bobbin holder shaft extending axially at one end thereof, apparatus for supporting the bobbin holder with respect to a stationary frame during high speed winding to provide a wound yarn ball on a bobbin on said bobbin holder, said supporting apparatus comprising:

a bobbin holder shaft support interposed between the bobbin holder shaft and the frame, and including bearing means for journalling the bobbin holder shaft, when supported thereby, for rotation about the longitudinal axis of the bobbin holder;

the elastic bushing means for engaging between the bobbin holder support and the frame, so that as a yarn ball is being wound on a bobbin on the bobbin holder, the yarn ball, bobbin, bobbin holder and bobbin holder shaft support are elastically movable relative to the frame;

the sum of the weights of the bobbin holder shaft support, bobbin holder shaft, bearing means and motor being greater than the sum of the weights of the bobbin holder, wound yarn ball and bobbin;

means for rotating the bobbin holder, bobbin holder shaft, bobbin and yarn ball being wound, about the longitudinal axis thereof for winding a yarn ball at an operating rotational speed, and

said bobbin holder and bobbin holder shaft, including the bobbin and yarn being wound thereon, having a primary and secondary critical rotational speed which is less than said operating rotational speed;

the frame including means defining a socket therein, the bobbin holder shaft support being coaxially received in the socket, and

the elastic bushing means comprising a plurality of axially spaced elastomeric O-rings interposed coaxially between the resiliently engaging both the bobbin holder shaft support and the frame in said socket;

the O-rings defining axially between them, and the bobbin holder shaft support and socket defining radially between them, a reservoir;

said reservoir being filled with a viscous oil.

4,114,820

YARN WINDING APPARATUS

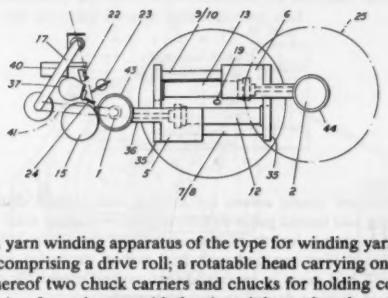
Andre Lafeber, Oestringen, Fed. Rep. of Germany, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 578,813, May 9, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,152

Claims priority, application United Kingdom, May 28, 1974, 23508/74

Int. Cl.[2] B65H *67/04*

U.S. Cl. 242—18 A **1 Claim**



1. A yarn winding apparatus of the type for winding yarn on cores comprising a drive roll; a rotatable head carrying on one side thereof two chuck carriers and chucks for holding cores, projecting from the rotatable head at right angles, the axis of the rotatable head being offset from the axis of the drive roll such that the carriers and chucks are wholly disposed on one side of the drive roll and the rotatable head being carried on a shaft which extends only from the side of the head opposite the carriers and chucks, the chuck carriers being carried on guide rails mounted on said head, the guide rail for one chuck carrier being laterally spaced to one side of the head axis, and in a plane perpendicular to the head axis, while the guide rail for the other chuck carrier is laterally spaced to the other side of the head axis, also in a place perpendicular to the head axis, the guide rails being long enough to allow the chuck carriers to pass over and under the rotatable head axis and to pass each other, to allow the maximum package diameter to be greater than the distance between the axis of the rotatable head and the nearest surface of the drive roll; means for moving and controlling the position of the chuck carriers on the guide rails; and yarn handling means for transferring and cutting the yarn when required.

4,114,821

METHOD AND APPARATUS FOR WINDING RAPIDLY RUNNING THREAD

Georg Thoma, Leitershofen, and Hans Müller, Memmingen, both of Fed. Rep. of Germany, assignors to Maschienefabrik Memmingen KG. Ing. Theodor Otto, Bavaria, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,568

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536021

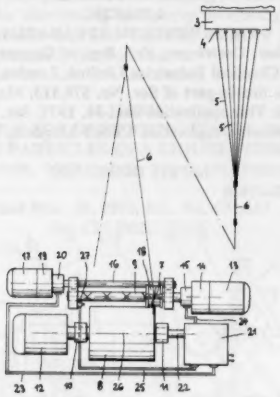
Int. Cl.[2] B65H *54/28*

U.S. Cl. 242—43 R **6 Claims**

1. In method of winding fast running thread on a winding bobbin, by means of a thread guide to which a plurality of different components of movement in the axial direction of the winding bobbin are applied, the improvement comprises the steps of: applying to the thread guide short, rapid oscillating movements of a length less than the length of the bobbin; moving the thread guide stepwise slowly from one end of the bobbin to the other; and after this stepwise traverse of the

length of the bobbin subjecting the thread guide to a rapid passing movement over the length of the bobbin.

5. Apparatus for the winding of fast running thread on a winding bobbin comprising: a bobbin with an axis; a slotted drum rotatably mounted adjacent to and movable in the axial direction of said bobbin; a thread guide engaged in the slot in



said slotted drum; means for driving said slotted drum and forcing said thread guide to follow a reciprocating axial movement having a length of movement less than said bobbin; a shifting device engaged with said slotted drum for stepwise moving said drum in an axial direction; and means for operating said shifting device at variable speeds.

4,114,822

THREAD DELIVERY DEVICE FOR TEXTILE MACHINES

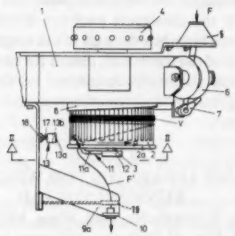
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 18, 1977, Ser. No. 825,765

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637120

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **10 Claims**



1. In a thread delivery device for textile machines, including a thread drum which can be driven for rotation about its longitudinal axis and on which a thread which is supplied from a storage bobbin can be wound tangentially for forming an intermediate thread storage and from which the thread can be withdrawn endwise over a withdrawal edge of the drum, a thread control element arranged in the area of the withdrawal edge for engaging the withdrawn thread, and a stationarily arranged withdrawal guide for engaging the withdrawn thread after it passes over the thread control element, comprising the improvement wherein the thread control element is constructed as an eyelet which is closed at least opposite the direction of rotation of the offrunning thread relative to the drum and is arranged approximately at the height of the withdrawal edge of the durm, the eyelet being mounted on an arm, bearing means coacting between the arm and the drum for rotatably supporting the arm on the drum for relative rotation therebetween about said longitudinal axis, said arm being stopped relative to the drum due to friction in said bearing means such that the arm is rotated along with the drum only when the actual tension in the withdrawn thread falls below a desired thread tension, the actual tension in the withdrawn thread when equal to said desired thread tension overcoming the friction in said bearing means so that said drum rotates relative to said arm, and a stop for limiting the rotative movement of the thread control element opposite the direction of rotation of the drum.

4,114,823

YARN DELIVERY APPARATUS FOR USE WITH TEXTILE MACHINES

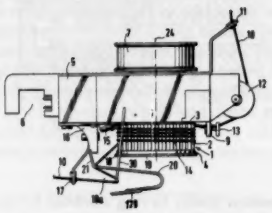
Josef Fecker, Bisingen-Steinhofen, and Gustav Memminger, Freudenstadt, both of Fed. Rep. of Germany, assignors to Gustav Memminger, Freudenstadt, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 827,966

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642183

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **21 Claims**



1. Yarn delivery apparatus for use in textile machines comprising

a storage drum (1) having a lower edge (18), on which at least one loop of yarn is wound to form a storage winding supply (14);

supply guiding means (9, 11, 12, 13) to guide yarn (10) to be supplied to a drum (1);

removal guiding means (17) to guide yarn being removed from the storage windings on the drum (1) and located laterally with respect to the axis of rotation (24) of the drum,

and including,

an intermediate yarn guide element (20, 120) located between the lower edge (18) of the drum (1) and said yarn removal guide means (17), said intermediate guide element (20, 120) being formed with at least one yarn guide edge (25) located adjacent the path of the yarn from the storage winding to the removal guide means (17) and laterally with respect to the axis of rotation (24) of the drum and with an elongated narrow guide slot (23) extending from adjacent said guide edge toward the axis of rotation (24) of the drum;

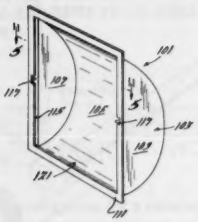
and a movable yarn sensing element (30) located in a position between said yarn guide edge (25) and the yarn removal guide means (17), said yarn sensing element being biased for movement toward the axis of rotation (24) of the drum absent tension of yarn passing thereover from the storage windings of the drum toward the yarn removal guide means (17).

4,114,824

PAPER HOLDER

Joseph H. Danielak, 2762 Poland St., Hamtramck, Mich. 48212

Filed Sep. 13, 1976, Ser. No. 722,994
Int. Cl.[2] A47K *10/22*
U.S. Cl. 242—55.53 1 Claim



1. A holder for an annular roll of toilet paper having a core and comprising a body having a back portion and a front portion, one of said portions being adapted to engage a vertical surface on which the holder is to be mounted, said front portion including parallel vertically extending tracks at opposite sides thereof, a spindle with a body to extend through said core and having pins of much smaller diameter than the spindle projecting outwardly at opposite ends to ride in said tracks, said spindle body being of less length than the space between the tracks, said tracks having means providing openings therein to receive spindle pins, said holder having a bottom portion engageable with the outside of a roll and extending to substantially within a spindle radius of the bottom ends of said tracks to serve as means to prevent the spindle from falling by gravity out of said tracks when all paper has been removed from the roll, said front portion comprising a rectangular frame adapted to engage a vertical surface and defining a substantially rectangular opening, said vertical tracks being a part of said frame, said back portion and bottom portion being combined into a substantially semi-cylindrical rearwardly extending portion extending from the top to the bottom of the front portion, said holder including sidewalls between said combined back and bottom portion and said front portion, said sidewalls having vertical channels formed therein adjacent their front edges and providing said tracks, the front of the tracks and the vertical sides of the frame each having an opening at substantially its vertical midpoint to permit insertion of said spindle pins into said channel tracks, said holder being symmetrical with respect to a line through said spindle receiving openings.

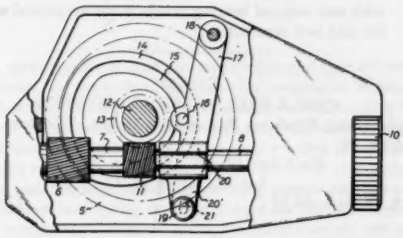
4,114,825

FISHING REEL WITH A LINE SPREADING DEVICE

Åke Eugen Murvall, Svängsta, Sweden, assignor to ABU Aktiebolag, Svängsta, Sweden

Filed Jul. 1, 1976, Ser. No. 701,964
Claims priority, application Sweden, Jul. 3, 1975, 7507630
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.21 R 7 Claims

1. A fishing reel comprising
a line spool which is axially reciprocably supported,
a winding mechanism located for winding a line on said spool,
a line spreading device for spreading the line on said spool by reciprocation of said spool when the line is wound thereon,
transmission means to rotate said winding mechanism and reciprocate said line spool,
a hand crank supported on a shaft, said transmission means connected to said shaft,
said transmission means including
a face gear means having a main gear wheel mounted on said crank supporting shaft,
said line spreading device including
a reciprocably mounted shaft supporting said spool,
a drive means cooperating with said transmission means for reciprocating said reciprocably mounted shaft and said spool to spread the line on said spool during winding,
an independently rotatable cam member supported for free rotation on an axis which is parallel with the longitudinal axis of said crank supporting shaft and the axis of said main gear wheel and connected to be rotated by said transmission means,
a cam profile on said cam member,
a drive mechanism connected to be driven by said cam profile and to reciprocate said reciprocably mounted shaft,
said drive mechanism including
a cam follower,
a pivotally mounted arm connected to said cam follower for pivoting by said cam follower, and



a dog mounted on said reciprocably mounted shaft and pivotally connected to said arm, the pivot axis between said arm and said dog being spaced from the pivot axis of said pivotally mounted arm,
said cam follower supported by said arm at a point between said axes
said rotatable cam member including a cam disc having said cam profile in the form of a groove on said cam disc,
said cam follower being a pin supported by said arm and engaging said groove on said cam disc,
said face gear means further including
a worm screw having the form of a worm wheel carried on said reciprocably mounted shaft and driven by said main gear wheel,
and a screw gear including both
a screw,
and a gear wheel mounted coaxially with said main gear wheel, which is driven by said screw and adapted to drive said cam member.

4,114,826

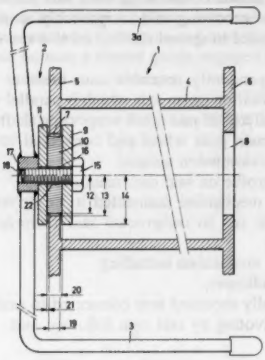
CABLE DRUM WITH ROTATABLE POSITIONING

Helmut Diebolder, Hauptstrasse 5, 7919 Osterberg, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,417
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609572
Int. Cl.[2] B65H *17/46*
U.S. Cl. 242—85 6 Claims

1. A cable drum comprising:
a frame member unilaterally supporting a bearing bolt having a distal head member;
a reel member having a central hub with an interior bearing flange defining a central recess encompassing and spaced from said bearing bolt; and
a bearing member within said recess encompassing said bearing bolt and retained by said head member;

said bearing member defining an outer circumferential groove that extends in annular spaced bearing relationship



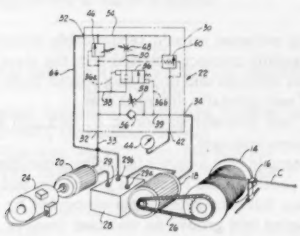
with said internal bearing flange as the rotational support for said reel member.

4,114,827

CABLE REEL VALVE AND SYSTEM

Albin Maier, Edinboro, Pa., assignor to Snap-Tite, Inc., Union City, Pa.

Filed Jun. 13, 1977, Ser. No. 805,835
Int. Cl.[2] B65H *75/42*
U.S. Cl. 242—86.51 **12 Claims**



1. A regulator valve for use with a cable reel mechanism to control the operation of a fluid powered motor unit that drives the cable reel, said valve including a housing, having a port adapted for coupling to a source of pressurized fluid, such as a constant output hydraulic pump, and a motor port adapted for coupling to the motor unit for the reel, and a reservoir port adapted for coupling to a fluid reservoir, and a pressure operated bypass valve in said housing communicating with said pump, reservoir and motor ports, and being operable to automatically sense the pressure differential across said pump and motor ports, so as to supply full pump pressure to the motor port when the reel is reeling in the cable and for bypassing the pump pressure from the pump port to reservoir when the reel is reeling out the cable and when the reel motor is stalled.

4,114,828

BOBBIN

Bernhard Hank Schneider, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed May 23, 1977, Ser. No. 799,372
Int. Cl.[2] B65H *75/10*
U.S. Cl. 242—118.3 **5 Claims**

1. A bobbin for use in a shuttle having a shuttle spring provided with grooves therein for receiving the rings of a bobbin for securing the bobbin therein, said bobbin comprising:

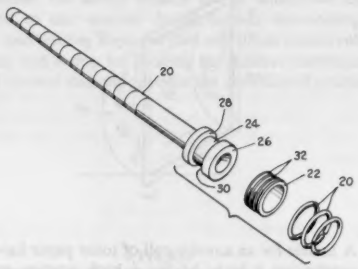
an elongated shank portion,

an enlarged diameter cylindrical butt end integral with one end of said shank portion,

a reduced diameter intermediate cylindrical portion provided on said butt end of said bobbin,

a resilient sleeve carried on said reduced diameter portion of said butt end, and

a plurality of longitudinally spaced metal rings carried on



said resilient sleeve, said rings being separated and independent from each other, and

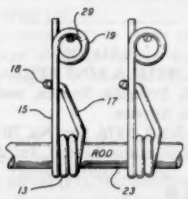
means for retaining said rings on said sleeve so when said rings of said bobbin are inserted in said grooves of said shuttle spring movement between said rings and grooves of said shuttle spring are minimized by said resilient sleeve absorbing shocks and minor deflections of said shank portion.

4,114,829

GUIDE FOR FILAMENTARY MATERIAL

William L. Boehler, Summerville, S.C., assignor to The Partnership of W. L. Boehler and A. G. Whaley Co., Inc., Andrews, S.C.

Filed Jun. 21, 1977, Ser. No. 808,528
Int. Cl.[2] B65H *57/08, 57/26*
U.S. Cl. 242—157 R **9 Claims**



1. A guide for guiding a filamentary material comprising

(a) a piece of spring steel wire having a coiled portion forming a spring of essentially circular cross-section with first and second lengths of wire extending therefrom, generally parallel to each other, said first length being longer than said second length;

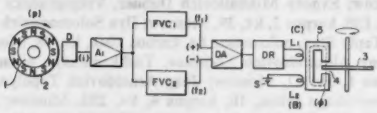
(b) means for holding said two lengths together; and

(c) means on the end of said first length for guiding filamentary material, whereby said coiled portion may be slid over a rod of diameter slightly smaller than the diameter of said coiled portion and said two lengths brought and held together thereby clamping said guide onto said rod.

4,114,830
ROTATION CONTROL SYSTEM

Juro Hoshi, Hamamatsu, and Makoto Watanabe, Tokyo, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 31, 1977, Ser. No. 801,995
Claims priority, application Japan, Jun. 2, 1976, 51/63551
Int. Cl.[2] B65H *59/38;* G03B *1/02*
U.S. Cl. 242—191 9 Claims



1. A rotation control system for a rotating member, comprising: detection means for generating a pulse signal having a frequency corresponding to the rotation speed of said rotating member;

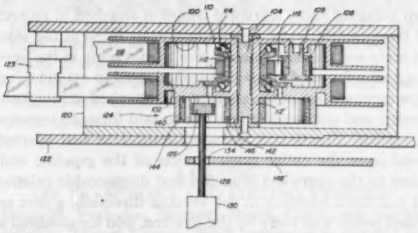
a plurality of frequency-voltage converters responsive to said pulse signal, for generating a signal representing the rate of change of said rotation speed; and

braking means, responsive to said signal representing the rate of change of said rotation speed, for controllably effecting braking of said rotating member.

4,114,831
CONCENTRIC REEL DRIVE FOR A TAPE CASSETTE

Robert B. Johnson, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 3, 1976, Ser. No. 720,288
Int. Cl.[2] G11B *15/32, 23/10*
U.S. Cl. 242—194 4 Claims



2. In a coaxial reel tape cassette provided for use with a tape player of the type having a drive member for cooperating with rotatable elements in the cassette, the cassette including first and second reels coaxially mounted for rotation therein, the improvement wherein the rotational elements comprise:

a first annular flange member associated with the first reel for rotating the first reel at a first velocity;

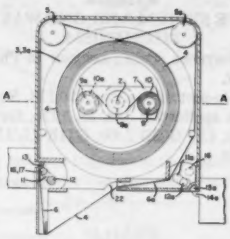
a second annular flange member associated with the second reel for rotating the second reel at a second velocity, said second annular flange member disposed concentrically with respect to said first annular flange member; and

said first and second concentric annular flange members together forming means defining an annular recess therebetween, said means defining said annular recess further adapted to receive the drive member freely therein for selective cooperation with said first and second annular flange members whereby said first and second reels are rotated at said first and second velocities, respectively, when corresponding said first and second flange members are selectively engaged by the drive member.

4,114,832
CARTRIDGE FOR TAPE-, RIBBON-, OR FILAMENT-LIKE INFORMATION STORAGE MEDIA

Wolfgang G. Tauscher, Wilh.-Meister-Str.3, D-638 Bad Homburg, Fed. Rep. of Germany

Filed Dec. 15, 1976, Ser. No. 750,823
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556872
Int. Cl.[2] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—194 9 Claims

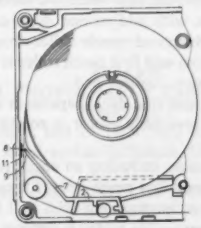


1. A cartridge for at least one tape or filament type information carrier, for use with an apparatus for recordal or transmission, which comprises a housing, openings in the housing for access to the information carrier, flaps covering said openings, a shaft fastened to the housing, two reels rotating around said shaft, one reel being the supply reel and the other reel being a take-up reel, the information carrier being guided between said reels, at least two spring constant torque mechanisms respectively comprising a Negator spring coiled in a supply roll and a working roll counter to its inherent pre-curvature and extending between a supply roll and a working roll, the direction of twisting of each spring band being directed counter to that of the other spring band, each one of the working rolls belonging to each of said spring mechanisms being coaxially mounted onto each reel, and arranged in the hollow hub in each reel, said reels having oppositely directed torques which generate a spring differential compensating drive to hold the information carrier in tension and the supply rolls are mounted on a common support which is loosely rotatable with the working rolls and the reels about said shaft.

4,114,833
MAGNETIC TAPE CASSETTE

August Liepold, Munich, Germany, assignor to AGFA-Gevaert AG, Leverkusen, Germany

Filed Apr. 19, 1977, Ser. No. 788,772
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618069
Int. Cl.[2] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—199 6 Claims



1. A magnetic tape cassette for recording and reproduction instruments, having two winding cores placed side by side, a magnetic tape adapted to be wound on and off the cores idler rollers to guide the tape between the cores, and an obliquely

extending rib between the core and an adjacent idler roller, the height of which rib is equal to the internal height of the cassette and the rib ends in close vicinity of the internal side wall of the cassette to leave a narrow gap for the passage of the magnetic tape travel, and the rib being tapered at the said free end in the form of a wedge.

4,114,834

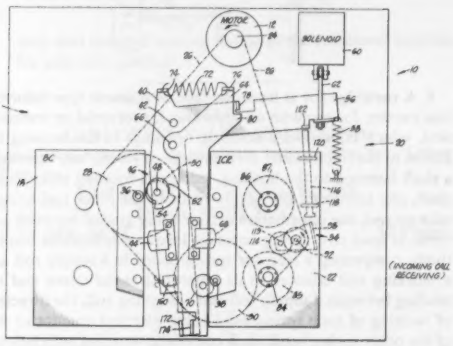
TAPE DRIVE SYSTEM AND ONE-WAY CLUTCH MECHANISM

Robert Haake, Torrance, Calif., assignor to Phone-mate, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 618,128, Sep. 30, 1975, abandoned. This application Jan. 29, 1976, Ser. No. 653,505

Int. Cl.[2] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—200 **7 Claims**



1. A tape drive system for a recording mechanism, comprising:

a reversible motor;

a first drive capstan connected to the reversible motor for driving a first recording tape in a first direction when said reversible motor is operating in a first direction;

a second drive capstan connected to the reversible motor for driving a second recording tape in a first direction when said reversible motor is operating in a first direction;

a first pinch roller adapted to engage said first drive capstan when said reversible motor is rotating in a first direction to cooperate with said first drive capstan to drive a first recording tape in a first direction;

a second pinch roller adapted to engage said second drive capstan to cooperate with said second drive capstan to drive a second recording tape in a first direction;

disengaging means for disengaging said first pinch roller from said first drive capstan when said second pinch roller is in engagement with said second drive capstan and for disengaging said second pinch roller from said second drive capstan when said first pinch roller is in engagement with said first drive capstan; and

means for rotating said first drive capstan in a second direction when said reversible motor is rotating in a second direction;

said disengaging means including an eccentric disc member associated with said first pinch roller for moving said first pinch roller out of engagement with said first drive capstan when said reversible motor is driving said first drive capstan in a second direction; and a spring member connecting said eccentric disc member to said first pinch roller; said spring member providing relatively slight frictional engagement between said first pinch roller and said eccentric disc member.

4,114,835

CARRIER FOR THE PNEUMATIC CONVEYING OF LOADS OVER A PIPELINE

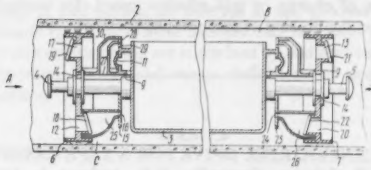
Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Vladimir Nikolaevich Gvozdev, Ryazansky prospekt, 68, korpus 1, kv. 267; Dmitry Evgenievich Geints, Flotskaya ulitsa, 16, kv. 116, all of Moscow; Dmitry Rudolfovich Gun, Komsomolskaya ulitsa, 7, kv. 29, Ljubertsy Moskovskoi oblasti; Viktor Alexeevich Dokin, ulitsa Obrucheva, 57, kv. 58, Moscow; Evgeny Mikhailovich Dubner, Volgogradsky prospekt, 120, korpus 2, kv. 39, Moscow; Ilya Solomonovich Kantor, Teply Stan, mikroraion 8a, korpus 10ab, kv. 98, Moscow; Evgeny Alexandrovich Lachinov, Tashkentskaya ulitsa, 14, korpus 1, kv. 27, Moscow; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 233, Moscow; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261, Moscow, and Alexei Vadimovich Chernikin, Leninsky prospekt, 67, kv. 132, Moscow, all of U.S.S.R.

Filed Jun. 24, 1977, Ser. No. 809,654

Claims priority, application U.S.S.R., Jun. 24, 1976, 2376874

Int. Cl.[2] B65G *51/04*

U.S. Cl. 243—32 **4 Claims**



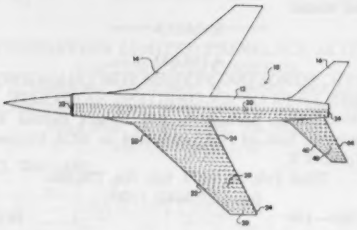
1. A carrier for the pneumatic conveying of loads over a pipeline comprising a body having end faces and sides; a forward trunnion and a rearward trunnion attached to respective end faces of said body; longitudinal seals fitted at the sides of said body and displaceable relative to said body in the vertical direction; a forward transverse seal adapted to extend over the entire cross section of the pipeline and attached to said forward trunnion and displaceable relative to said forward trunnion in the vertical direction; a rearward transverse seal adapted to extend over the entire cross section of the pipeline and attached to the rearward trunnion and displaceable relative to said rearward trunnion in the vertical direction; a first space defined below said body by the pipeline, said longitudinal seals and said forward and said rearward transverse seals when said carrier is positioned in the pipeline; a second space defined above said body by the pipeline, said longitudinal seals and said forward and said rearward transverse seals when said carrier is positioned in the pipeline; at least one first opening provided in said rearward transverse seal for placing said first space below said body in communication with a space in the pipeline behind a travelling carrier; at least one first opening provided in said forward transverse seal for placing said second space in communication with a space in the pipeline before the travelling carrier; a gate attached to said body at its end which faces said rearward transverse seal for closing said opening in said rearward transverse seal either partially or in full as a result of differential pressure existing at said longitudinal seals so as to control a lifting force which acts on said body of the carrier; at least one through opening formed in one of the longitudinal seals placing the space below the body in communication with the space above the body; and a gate attached to the body for closing said through opening either partially or in full depending on the differential pressure existing at the longitudinal seals.

4,114,836

AIRPLANE CONFIGURATION DESIGNED FOR THE SIMULTANEOUS REDUCTION OF DRAG AND SONIC BOOM

Blair M. Graham, Rte. 1, Union Hall, Va. 24176, and Harry C. Hamrick, Arlington, both of Va., assignors to Blair M. Graham, Goldsboro, N.C.

Filed Mar. 9, 1977, Ser. No. 775,729
Int. Cl.[2] B64C *21/02, 1/40*
U.S. Cl. 244—1 N 6 Claims



6. A method for reducing parasite drag and substantially eliminating sonic boom in an aircraft having an airfoil having a leading edge, a trailing edge, and flying at speeds approaching and exceeding the speed of sound comprising the steps of:

(a) providing a plurality of linear air flow paths through said airfoil extending along longitudinal axes substantially parallel to the flight path of said airfoil and extending from said leading edge to said trailing edge, said air flow paths diverging on either side of said longitudinal axes from said leading edge to said trailing edge;

(b) providing openings in the leading edge of said airfoil through which said air flow enters said airfoil of such size and number as to reduce the effective surface area of said leading edge by at least 10%;

(c) providing openings in said trailing edge through which said air flow is discharged from said air flow paths;

(d) alternately opening said leading edge openings as the speed of sound is approached and closing said leading edge openings as the airfoil slows to speeds below the speed of sound;

(e) whereby said air flow paths spoil the partial vacuum which forms behind said trailing edge at sonic and supersonic speeds.

4,114,837

AIR TRANSPORT AND LIFTING VEHICLE

Vladimir H. Pavlecka, Newport Beach, Calif., and David G. McIntyre, Mount Vernon, Wash., assignors to Skagit Corporation, Sedro Woolley, Wash.

Filed Mar. 24, 1977, Ser. No. 780,933
Int. Cl.[2] B64B *1/34*
U.S. Cl. 244—26 14 Claims

1. A lifting air vehicle comprising in combination:

rotor means,

power means connected to drive said rotor means,

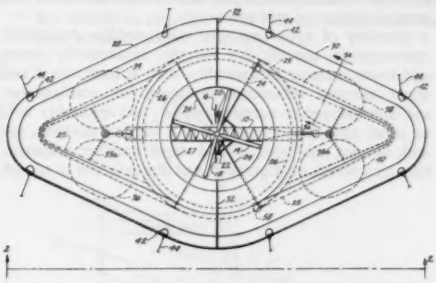
a keel structure including a circular truss coaxial with said rotor means and additional truss members forming triangular sections forward and aft of said circular truss,

a frame and radial truss arms fastening said frame to said keel structure, said frame carrying and supporting a pilot's cabin, auxiliary power means, said power means for driving said rotor means and propeller means for providing torque compensation to said rotor means and for yaw control,

port and starboard forward driving propellers attached to said frame driven by said auxiliary power means,

landing gear means carried on said radial truss arms and an inflatable pad attached to said frame for supporting said vehicle when on the ground,

and an inflatable envelope structure including first and second generally triangular members secured to said keel structure at the front and back of said vehicle, said members being fastened together at the center of the vehicle to define a large center opening above said rotor means.



4,114,838

CARRIER FOR SKIS AND SKI POLES

James E. Knauf, 4425 E. 4th St., Long Beach, Calif. 90814

Filed Nov. 22, 1976, Ser. No. 743,927
Int. Cl.[2] A45C *71/00*
U.S. Cl. 224—45 S 4 Claims

1. A carrier for skis comprising an elongated main strap, an end strap extending transversely to said main strap adjacent to each end thereof, the midportions of said end straps being secured to the opposite ends of said main strap, a Velcro patch carried by the inside of one end of each of said end straps, a complementarily formed Velcro patch carried by the outside of the opposite end of each of said end straps, said Velcro patches adapted to engage each other to secure said end straps around said skis, each of said end straps being adapted to extend around one end of a pair of skis, said end straps adapted to be tightened by sliding movement from the end of said skis toward the midportion of said skis, said end straps in use being disposed adjacent to and on opposite sides of the bindings of said skis, and a pair of elongated slots formed in said main strap adjacent to the opposite ends thereof, said slots being adapted to hold the opposite ends of a pair of ski poles when said carrier is in use, said end and said main strap being foldable and then folding into a substantially thin compact package not substantially larger in either transverse direction than the width of said main straps and adapted to be held in such folded position by engagement between the Velcro patches of the other of said end straps.

4,114,839

AERIAL PHOTOGRAPHY CAMERA MOUNT ASSEMBLY

Clarence E. Sibley, HQ 26 TRW, Box 1331, APO New York, N.Y. 09860, and Francisco C. Sablan, 13 Woodland Dr., Mary Esther, Fla. 32569

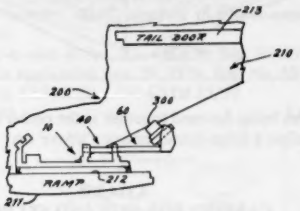
Filed Aug. 19, 1977, Ser. No. 826,085
Int. Cl.[2] B64D *47/08*
U.S. Cl. 244—118 R 10 Claims

1. An aerial photography camera mount assembly, adapted for use with an aircraft having a tail, a downwardly and outwardly opening tail ramp, an internal surface on said tail ramp, a plurality of cargo tiedown rings affixed to said internal surface, and an upwardly and inwardly opening tail door comple-

mentary to said tail ramp, wherein said tail ramp and said tail door can be opened and closed during aerial flight of said aircraft, comprising:

a. a lower member subassembly removably attached to said internal surface of said tail ramp;

b. a plurality of upper member subassemblies detachably connected to, and slidably movable horizontally above, said lower member subassembly, with at least one of said upper member subassemblies structured, configurated, and dimensioned to accept, support, and releasably hold an aerial photography camera in a vertical position, and with at least one other of said upper member subassemblies structured, configurated, and dimensioned to accept,



support, and releasably hold another aerial photography camera in an oblique position;

c. means, connected to said plurality of upper member subassemblies, for locking said subassemblies in an extended, and in a retracted, preselected position;

d. and, means, releasably connected to said lower member subassembly and to said plurality of upper member subassemblies, for preventing the inadvertant over-extension, and the inadvertant over-retraction, of said plurality of upper member subassemblies when said plurality of upper member subassemblies are not locked, respectively, in a preselected extended position, and in a preselected retracted position.

4,114,840

PARACHUTE CANOPY DEPLOYMENT CONTROL APPARATUS

Herbert R. Brown, Monroe County, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 21, 1977, Ser. No. 844,163
Int. Cl.² B64D *17/36*
U.S. Cl. 244—152 **3 Claims**

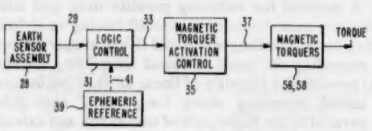
1. In combination with a parachute system having a parachute canopy with a skirt band around the bottom thereof and a plurality of radial seams with a parachute suspension line secured to each of said radial seams, comprising: a first reinforcement ribbon secured to said canopy a predetermined distance from the bottom edge of the canopy; a second reinforcement ribbon secured to the canopy a distance from the first ribbon substantially equal to the distance between the first ribbon and the edge of the canopy; an anti-inversion netting secured to the outer surface of said parachute canopy along the first reinforcement ribbon; a reefing line; means for securing the reefing line to said second reinforcement ribbon internally of said canopy adjacent each radial seam; means for securing the lower edge of said canopy to said reefing line; means for securing said anti-inversion netting to said reefing line and to the parachute suspension lines at alternate radial seams and means for connecting the anti-inversion netting to the parachute suspension lines at the radial seams between said alternate radial seams.

4,114,841

MAGNETIC TORQUING SYSTEM FOR CHANGING THE SPIN RATE OF AN ORBITING SATELLITE

Ludwig Muhlfelder, Livingston, and Robert Benson Hogan, Cinnaminson, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,504
Int. Cl.² B64G *1/00*
U.S. Cl. 244—166 **18 Claims**



1. A magnetic torquing system in a closed-loop system in a spacecraft orbiting a celestial body for automatically changing the spacecraft angular momentum about the spin axis to thereby control the spin rate of the spacecraft, said celestial body having an ambient magnetic field, comprising:

a. magnetic torquing means oriented in said spacecraft to produce when energized a magnetic dipole substantially transverse to the spin axis of said spacecraft;

b. celestial body sensor means mounted on said spacecraft for sensing the celestial body including means for orienting said spin axis substantially colinear with the line of sight axis of said sensor means for symmetrical scanning of said celestial body, said sensor means generating in response to the detection of the celestial body an output signal;

c. logic means coupled to said sensor means for generating in response to said sensor output signal a logic output signal, said logic output signal representing a selected desired magnetic dipole configuration; and

d. energizing means coupled to said logic means for generating in response to said logic output signal a signal for energizing said magnetic torquing means such that the magnetic dipole generated therefrom reacts with the magnetic field of the celestial body to produce a magnetic torque along the spin axis of said spacecraft to change the spacecraft angular momentum and thereby the spin rate of said spacecraft.

10. A method for magnetically torquing in a closed-loop system a spacecraft orbiting a celestial body to automatically change the spacecraft angular momentum about the spin axis to thereby control the spin rate of the spacecraft, said celestial body having an ambient magnetic field, comprising the steps of:

a. sensing said celestial body by sensor means oriented on said spacecraft such that said spin axis is substantially colinear with the line of sight axis of said sensor means, said sensor means generating in response to the detection of the celestial body an output signal;

b. generating in response to said sensor output signal a logic output signal by logic means coupled to said sensor means,

said logic output signal representing a selected desired magnetic dipole configuration;

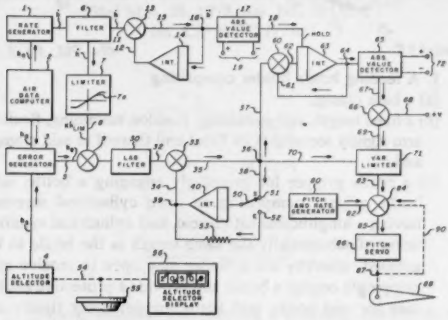
c. generating in response to said logic output signal a signal for energizing magnetic torquing means by energizing means coupled to said logic means; and

d. magnetically torquing said spacecraft by energizing said torquing means to produce a magnetic dipole to react with the magnetic field of said celestial body to generate a torque along the spin axis of the spacecraft to change the spacecraft angular momentum and thereby the spin rate of said spacecraft.

4,114,842
ACCELERATION LIMITED PRESELECT ALTITUDE CAPTURE AND CONTROL

Henry E. Hofferber, and Robert H. Parker, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,153
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—180 **15 Claims**



4. In a craft flight control system, apparatus for controlling craft flight from a first altitude to a second altitude and the capture of said second altitude comprising:

sensor means for sensing said first altitude,

selector means for selecting said second altitude,

combining means responsive to said sensor means and to said selector means for generating a difference signal,

variable limiter means responsive to said difference signal, and

servo means for controlling said craft with respect to the pitch axis thereof in response to motion of said craft about said pitch axis and in addition in response to said variable limiter means,

said variable limiter means having limits adjustable in magnitude in response to said difference signal.

4,114,843
CONTROL STICK ASSEMBLY

Frank D. Robinson, Rancho Palos Verdes, Calif., assignor to Robinson Helicopter Co., Torrance, Calif.

Filed Oct. 4, 1976, Ser. No. 729,161
Int. Cl.[2] B64C *13/12*
U.S. Cl. 244—84 **10 Claims**

1. In a dual control aircraft movable in a lateral and longitudinal direction and having airfoil surfaces to effect lateral and longitudinal orientation of the aircraft, and wherein the aircraft is provided with side-by-side pilot and copilot seats arranged on each side of the center axis of the aircraft, the improvement comprising

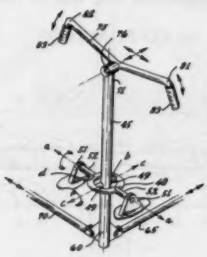
a single non-rotatable control stick for lateral and longitudinal orientation of the aircraft,

said stick being located generally on the center axis of the aircraft,

means forming a joint for mounting said stick for pivotal movement in a lateral and longitudinal direction,

crossbar means hingedly mounted on said stick vertically above said joint whereby said crossbar is tiltable freely in a vertical plane without effecting aircraft orientation,

means connected to said stick to effect movement of said airfoil surfaces for lateral and longitudinal orientation of the aircraft in response to lateral and longitudinal movement of said control stick, and

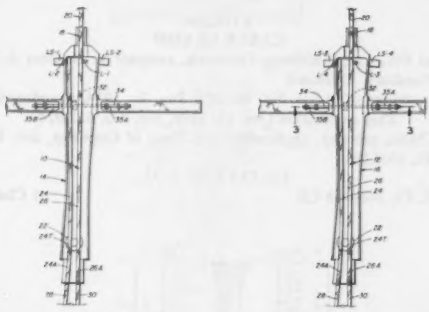


spaced grip means mounted on said crossbar and, in a centered position of said control stick, being located forward of and generally centered in front of each of said seats whereby either the pilot or copilot may control lateral and longitudinal orientation of the aircraft through movement of said single control stick.

4,114,844
TONGUE SWITCH FOR RAIL INSTALLATIONS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,357
Int. Cl.[2] B61L *5/10*
U.S. Cl. 246—162 **3 Claims**



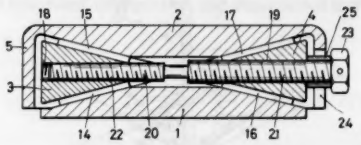
1. In a track installation where pivotal tongue switches are interposed between the main track and the tangent track to govern traffic: a system to indicate the position of the tongues and comprising two limit switches positionable on opposite sides of each tongue and having actuators separated by the included angle of tongue movement between the home position of each tongue, each limit switch at one tongue being paired to a limit switch at the other tongue corresponding to a home position; the limit switches thus paired each having two pairs of normally closed contacts arranged in parallel to one another which open only when the tongues are in home position, the two pairs of parallel contacts of one limit switch being joined in series to the two pairs of parallel contacts of the other limit switch and the respective pairs being series-connected to a time delay relay which thereby starts to time out as the tongues are in transit, and said time delay relay having normally open contacts series-connected to an indicator which is energized by closure of the time delay relay contacts if the tongues are too long in transit.

4,114,845

SUPPORT APPARATUS BEING ADJUSTABLE AS TO HEIGHT AND INSULATING VIBRATIONS FOR MACHINES AND THE LIKE

Gottfried Weisenberger, Mainz, Germany, assignor to Effbe-Werk Fritz Brumme & Co. K.G., Raunheim, Germany

Filed Apr. 27, 1977, Ser. No. 791,490
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620162
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—24 8 Claims



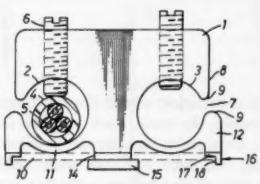
1. An adjustable height support unit, comprising, a casted base member having unmachined surfaces meeting to form an apex and extending downwardly therefrom in a longitudinal direction, a casted support member having unmachined surfaces meeting to form an apex and extending upwardly therefrom in a longitudinal direction, a pair of casted wedge members between said members and having surfaces in respective juxtaposition and parallel relation to said base member and support member unmachined surfaces, resilient elements respectively between juxtapositioned pairs of said surfaces, one side of which is attached to one surface of each of said pairs and the other side of which is slidably resting on the other surface of each of said pairs, and motive means for forcibly moving said wedge members in opposite direction in unison to raise and lower said support member relative to said base member.

4,114,846

CABLE CLAMP

Poul Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 483,093, Jun. 26, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,074
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1973, 2335209
Int. Cl.[2] F16L *3/22*
U.S. Cl. 248—68 CB 1 Claim



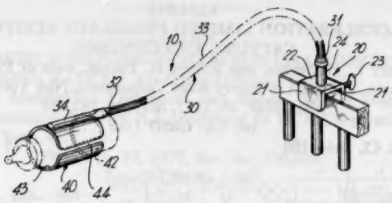
1. A clamp assembly comprising a body member having two slotted openings formed in part by two flexible wall portions, a foot element between said wall portions connected thereto with a reduced neck formed by grooves, downwardly extending projections respectively on the other sides of said wall portions, a base plate having an apertured slot for receiving said neck, said base plate having two edges on opposite sides thereof, two recesses formed respectively therein in said edges which are spaced from said apertured slot for receiving said projections, said projections and said edges being cooperable during assembly to resiliently stress and displace said flexible wall portions prior to said projections reaching and being received in said recesses after which said flexible wall portions resiliently bias said projections in locking engagement with said recesses to prevent dislodgment of said body member by any external force applied to any part thereof.

4,114,847

FEEDING BOTTLE HOLDER

Joseph Bogensberger, Box 208, Sundridge, Ontario, Canada (POA 1Zo)

Continuation of Ser. No. 651,314, Jan. 22, 1976, abandoned. This application Apr. 13, 1977, Ser. No. 787,127
Int. Cl.[2] A47D *15/00*
U.S. Cl. 248—104 5 Claims



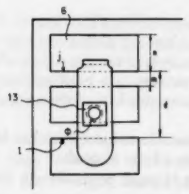
1. A feeding bottle holder comprising
(a) a base clamp,
(b) a fixed length, self-sustaining, position sustaining, flexible arm rigidly secured at its distal end thereof to said clamp; and
(c) a bottle gripper for grippingly engaging a bottle, said bottle gripper comprising an open cylindrical member having a longitudinal slit therein, said cylindrical member being of substantially the same length as the bottle to be gripped, whereby the cylinder may open to receive and grippingly engage a bottle and provide a protective enclosure for said bottle, said bottle gripper being rigidly secured to the proximal end of said arm, by means including an integral longitudinal securement spline extending along substantially the entire longitudinal length of said open cylindrical member adjacent said longitudinal slit, said spline terminating in an integral longitudinally extending cylindrical coupling overhanging the adjacent rim of the open cylindrical member and rigidly secured to said flexible arm, with the longitudinal axes of said spline, said cylindrical coupling and the coupled end of said flexible arm being coextensive, said longitudinal securement spline and said flexible arm combining to provide positive retention action which minimizes the movement of the bottle caused by motion of the liquid contained therein.

4,114,848

MOUNTING PLATE

Pierre Jean Bernard, Versailles, France, assignor to La Telemecanique Electrique, France

Continuation of Ser. No. 538,387, Jan. 3, 1975. This application Nov. 5, 1976, Ser. No. 740,621
Int. Cl.[2] A47B *91/00*
U.S. Cl. 248—346 5 Claims



1. A mounting plate for use in conjunction with
(a) devices to be attached to said mounting plate, said de-

vices including openings to receive fastening screws, the centre-to-centre distances of said openings being whole multiples of a predetermined modulus *e*

(b) fastening screws for attaching said devices to said mounting plate, said screws having a predetermined diameter ϕ; said mounting plate including a plurality of rectangular holes each of the same dimensions and defining cross-members between neighbouring holes, the spacing (p) of neighbouring rectangular holes being the smallest value which satisfies all of the conditions that:

(i) (p) is the product of modulus *e* and an odd number not less than 3;

(ii) (p) is greater than the sum of modulus *e* and one-and-a-half times the diameter ϕ of the screws; and

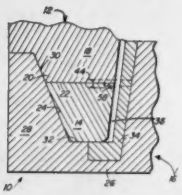
(iii) (p) is such that the width of each cross member is not less than half the diameter ϕ of the screws.

4,114,849

PIVOT MOLD ASSEMBLY

John W. von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Filed Mar. 28, 1977, Ser. No. 781,631
Int. Cl.[2] B29C *1/14*
U.S. Cl. 249—58 **7 Claims**



1. A mold assembly for forming a retaining portion on a freely rotatable pail handle extending through a passage formed in one wall of the retaining portion to a position intermediate said one wall and an annular wall of the pail, formed by a pair of ring members with said annular wall spaced from said one wall and integrally interconnected with said one wall by a pair of spaced side walls and a top wall at a plurality of positions spaced circumferentially of said handle, the improvement comprising:

a pair of slide members extended between said one wall and said annular wall and into engaging relationship in response to axial movement in one direction of one of said ring members to define a mold cavity for forming said retaining portion on said rotatable handle;

and means operatively associated with said slide members, for disengaging said slide members and for guiding said slide members axially of said annular wall to disengage said slide members from between said one wall and annular wall in response to axial movement of said one ring member in the opposite direction.

4,114,850

MODULATING PLUG VALVE

Leo Alamprese, Wood Dale, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 12, 1976, Ser. No. 704,198
Int. Cl.[2] F16K *1/48, 1/54*
U.S. Cl. 251—86 **13 Claims**

1. A valve comprising:

a housing having inlet and outlet openings;

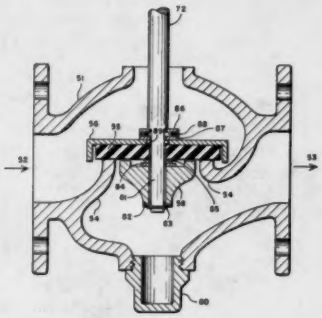
a valve seat within said housing for permitting a flow of fluid from said inlet opening to said outlet opening;

a valve stem extending through said housing;

disc means mounted on, and for angular movement with respect to, said valve stem for seating against said valve seat to cut off said flow when said stem moves said disc means against said valve seat;

plug means; and,

mounting means for mounting said plug means on said valve stem for permitting lateral and angular motion of said plug means with respect to said valve stem and said disc means;



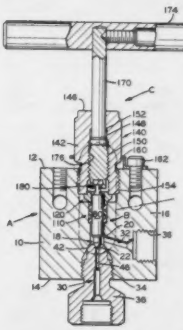
said plug means for modulating said flow when said disc means is moved away from said valve seat by said valve stem.

4,114,851

HIGH PRESSURE VALVE

Robert A. Shivak, Parma, and David J. Johnston, Sagamore Hills, both of Ohio, assignors to Sno-Trik Company, Solon, Ohio

Filed May 10, 1976, Ser. No. 684,629
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—88 **15 Claims**



11. A valve of the type having a body with a valve chamber which receives a valve needle selectively reciprocal therein between engaging and non-engaging relationships with a valve seat for controlling fluid flow between inlet and outlet passages; compressible sealing means disposed in an enlarged passage adjacent one end and coaxial with said valve chamber for sealing said valve needle; an alignment bushing received over said valve needle for compressing said sealing means into the desired sealing condition with said valve needle; and, a packing nut threadedly received in said valve body generally coaxial with said valve chamber with the lowermost end thereof acting upon said alignment bushing, the improvement comprising:

said alignment bushing having opposed first and second end faces, said alignment bushing being dimensioned for free reception of said first end face in said enlarged passage to apply a compressive force against said sealing means generally axially of said enlarged passage, said second end face including a circumferential groove closely receiving

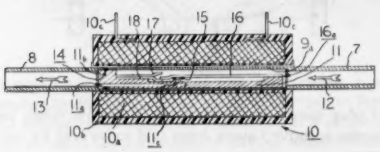
at least a portion of the lowermost end of said packing nut, said groove and nut having cooperating driving surface engaged generally axially of said valve needle to compress said sealing means and having cooperating alignment surfaces engageable generally radially of the longitudinal axis of said valve needle to axially align said bushing with said packing nut and automatically align said bushing in said enlarged passage to automatically align said valve needle in said valve chamber.

4,114,852

MINIATURE REED-TYPE VALVE

Yves J. Fournier, 49 Thornberry Rd., Winchester, Mass. 01890

Filed May 20, 1977, Ser. No. 798,797
Int. Cl.[2] F16K *31/06*
U.S. Cl. 251—138 **14 Claims**



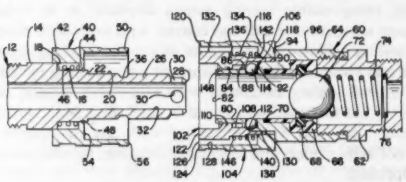
1. A fluid valve arrangement comprising a hollow member of nonmagnetic material having upstream and downstream portions which are to be valved in relation to one another, a body including nonmagnetic material fitted within said hollow member and sealed with the interior thereof about its outer periphery at a position therealong, said body having a valve seat and a passageway extending therethrough from one side of said position to said valve seat on the opposite side of said position, a valve member, flexible means supporting said valve member on said body for movements between two limits at which said valve member is in seated closing engagement with said valve seat and is out of said engagement and opens said seat, respectively, mechanical stop means fixed with said body and flexible means and disposed for mechanical engagement which limits said movements when said valve member opens said seat, said flexible means normally resiliently urging said valve member to and holding said valve member at one of said limits, said flexible means having material operatively associated therewith which interacts magnetically with magnetic field flux impressed from outside said hollow member to force said valve member to the other of said limits, and means outside said hollow member for impressing said magnetic field flux and thereby actuating said valve arrangement.

4,114,853

QUICK CONNECT COUPLING

Richard J. Medvick, Bedford, Ohio, assignor to Swagelok Company, Hudson, Ohio

Filed Oct. 8, 1976, Ser. No. 730,941
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 251—149.6 **19 Claims**



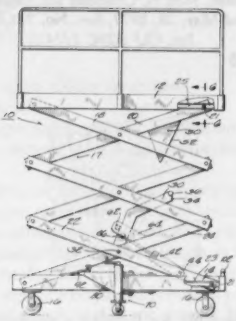
1. A quick connect coupling member having inner and outer sleeves including outer terminal ends located adjacent one another, said sleeves being radially spaced from one another at said outer terminal ends and over at least a portion of their length inwardly from said outer terminal ends to define an axially extending recess opening outwardly between said outer terminal ends, locking detents carried by said coupling member for movement relative thereto between coupling and releasing positions, said inner sleeve cooperating with said locking detents and being axially movable relative to said coupling member and to said outer sleeve between locking and unlocking positions for respectively locking said detents in said coupling position and providing movement of said detents to said releasing position, and yieldable biasing means for normally biasing said inner sleeve to one of said positions.

4,114,854

SCISSORS LIFT WORK PLATFORM

Albert L. Clark, West Bend, Wis., assignor to Pac-Craft Products, Inc., West Bend, Wis.

Filed Jun. 10, 1977, Ser. No. 805,262
Int. Cl.[2] B60P *1/02*
U.S. Cl. 254—122 **3 Claims**



1. In a scissors lift supported on a base and having a work platform and a scissors linkage having two spaced sets of links connecting said base and said platform for elevating said platform above said base to a working position, each of said sets of links having first and second lower links pivotally connected together, with said first links being pivotally connected to said frame by a fixed pivot and said second links being provided with a roller at the end of said second links, and tracks on said base for confining and providing guided movement of said roller during raising and lowering of said linkage, the improvement comprising an arm, means for pivotally connecting said arm to one of said links, said arm having a free end, a cam surface on another of said links, an abutment on one of said links, and power cylinder means having one end pivotally connected to said arm intermediate its length and said cylinder having another end directly pivotally connected to said second links between said connection of said second links and said roller on said second links to swing said arm about its pivotal connection through a first arc portion in which said free end is engaged with and bears against said cam surface to cause unfolding of said linkage to a partially extended position and to cause further movement of said arm through a second arc portion when said arm bears against said abutment to raise said linkage from the partially extended position to the fully extended position.

4,114,855

COLLECTOR FOR HOIST CHAIN

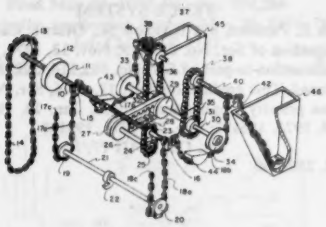
James R. Adamson, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1977, Ser. No. 810,821
Int. Cl.[2] B66D *1/76*
U.S. Cl. 254—175.5 **3 Claims**

1. In a chain hoist including a shaft connected to drive a

chain sprocket; a chain reeved around said sprocket, and having a load end and a tail end, whereby said load end of said chain may be hauled in and paid out by said sprocket, the improvement comprising:

a chain collector for said tail end of said chain, said collector including: a drive pulley affixed to said shaft; a driven shaft having at least a chain storage sprocket around which said tail end of said chain is reeved and a driven pulley affixed to said driven shaft; drive means between said pulleys; and a chain storage bin adjacent said chain storage sprocket whereby said tail end of said chain is



deposited in said bin by said chain storage sprocket as said load end of said chain is hauled in, and whereby said tail end of said chain is fed from said bin as said load end of said chain is paid out, wherein said drive means includes:

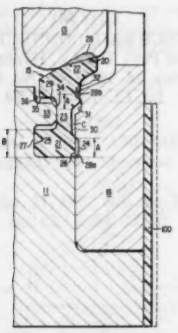
an intermediate shaft having two intermediate pulleys affixed thereto and a first torque conveyer between one of said intermediate pulleys and said drive pulley; an idler shaft having at least two idler pulleys affixed thereto; a second torque conveyer between the other one of said intermediate pulleys and a first one of said idler pulleys; and a third torque conveyer between said driven pulley and the other of said idler pulleys.

4,114,856

VALVE SEAT INSERT

Jerry D. MacAfee, Northboro, and Ronald J. Collette, Spencer, both of Mass., assignors to Jamesbury Corp., Worcester, Mass.

Filed Mar. 7, 1977, Ser. No. 775,311
Int. Cl.² F16K *1/22*
U.S. Cl. 251—306 **3 Claims**



1. A butterfly valve comprising:

a valve housing with a fluid flow channel passing therethrough;

a disc mounted in said valve housing for rotation about an axis substantially perpendicular to the flow axis of said fluid flow channel, and having a sealing surface on its edge;

annular seat means in said valve housing disposed to cooperate with said sealing surface to interrupt flow through said valve when said closure member is rotated into the closed position;

an insert disposed adjacent to said annular seat means;

said insert having locking ridge means positioned on the radially inward edge of said insert, a zone of interference with said seat positioned radially outward of said locking ridge means, and means providing a clearance between said insert and said seat positioned between said locking ridge means and said zone of interference;

said seat and said insert having an interference fit when said valve is assembled which is limited to the outer periphery of said seat ring at said zone of interference, and to the site of said locking ridge means but with said clearance accommodating seat material displaced by said interference fit,

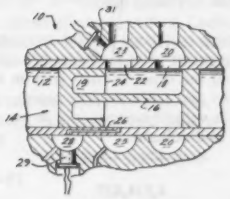
whereby undesirable radially inward movement of said seat of a magnitude that would undesirably increase the operating torque of the valve is prevented.

4,114,857

SPOOL TYPE METERING VALVE

Pasquale Columbo Bondi, Revere, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 28, 1976, Ser. No. 736,481
Int. Cl.² F16K *3/26*
U.S. Cl. 251—324 **2 Claims**



1. In combination with a metering valve of the type comprising a hollow cylindrical casing disposed within a valve housing, said casing including an axially extending bore and axially spaced apart fluid inlet and outlet ports disposed in said casing in fluid communication with each other through said bore, a spool disposed in said base and having circumferentially relieved areas cooperating with said bore to define therewith an axially restricted flow path between said inlet and outlet ports, said spool including a land area adapted to overlap at least a portion of said outlet port so as to restrict the flow of fluid through said outlet port, the improvement comprising:

a tube extending through said casing, one end of said tube in fluid communication with said axially restricted flow path at a point immediately upstream of said outlet port and the other end thereof said tube disposed at a point external to the casing;

a first cavity surrounding said other end of said tube and formed integrally with said housing, said cavity providing a first annulus from which the internal pressure at said point immediately upstream of said outlet port may be measured;

a second cavity surrounding said outlet port at a point immediately downstream of said outlet port to provide a second annulus from which the pressure at said point immediately downstream of said outlet port may be measured;

a first pressure transducer operatively connected to said first annulus for measuring the pressure at said upstream point; and

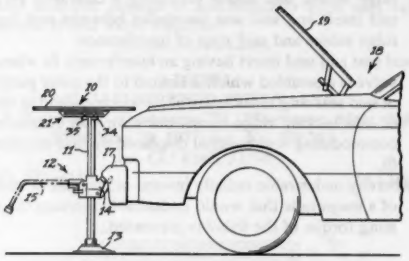
a second pressure transducer operatively connected to said second annulus for measuring the pressure at said downstream point.

4,114,858

TABLE TOP ASSEMBLY FOR VEHICLE BUMPER JACK

Thomas J. Greeson, 245 Graeme Dr., Nashville, Tenn. 37214

Filed Nov. 25, 1977, Ser. No. 854,713
Int. Cl.[7] B66F *11/00*
U.S. Cl. 254—1 **8 Claims**



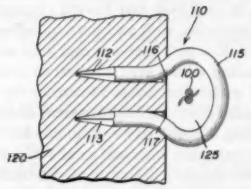
1. A table top assembly for a vehicle bumper jack having an elongated column of predetermined cross-section and a bumper hook longitudinally movable on said column, comprising:
(a) a table support member,
(b) a table top,
(c) means securing said table top to said table support member,
(d) a pair of jaws having opposing gripping surfaces contoured to fit the opposing surfaces of the column of said bumper jack,
(e) means securing said jaws to said support member for adjustable movement of at least one of said jaws toward and away from the other of said jaws in a longitudinal path relative to said table support member, for gripping the column of a vehicle bumper jack to support said table top on top of said column.

4,114,859

FENCE STAPLE

Stanley E. Stenson, R.R. 1, Box 30, Covington, Mich. 49919

Filed Feb. 3, 1977, Ser. No. 765,248
Int. Cl.[2] B21F *27/00*
U.S. Cl. 256—48 **1 Claim**



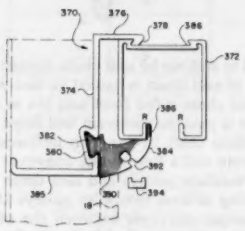
1. A fastener mounted on each of a plurality of wooden posts to hold barbed wire, a pair of straight substantially parallel spaced-apart shanks each sharpened at one end thereof and driven into said wooden post in a plane parallel to the post and straddling said wire, each of said shanks being integral at the other end thereof with a curved shoulder portion extending laterally outwardly in a direction away from the other one of said shanks, each shoulder portion including a first portion having a large radius of curvature centered outside the associated leg and a second portion having a small radius of curvature centered inside the associated leg, and an arcuate bight portion integral with and interconnecting said second portions of said curved shoulder portions and having a large radius of curvature centered between said legs for defining with the post an enlarged substantially elliptical opening having its minimum dimension in said plane greater than the lateral distance between said shanks and proportioned for accommodating free movement of two strand, four barbed wire therethrough, while said curved shoulder portions limit the distance that said shanks can be driven into the associated post for maintaining the uniformity of said enlarged opening whereby mounting of said fastener on the associated post provides support for said barbed wire passing therethrough yet permits free movement of the barbs as the wire is moved between a taut and a slack condition.

4,114,860

FENCE SYSTEM

Rudolph E. Parisien, 891 Rainbow St., Ottawa, Canada

Continuation of Ser. No. 523,129, Nov. 12, 1974, which is a continuation-in-part of Ser. No. 382,116, Jul. 24, 1973, abandoned. This application Nov. 19, 1976, Ser. No. 743,474
Claims priority, application Canada, Jun. 14, 1973, 174105; Nov. 19, 1973, 186172; Feb. 21, 1974, 193180
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—65 **7 Claims**



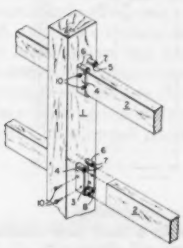
1. In a fence including line posts and top rails in the form of channel members, a top rail bracket for use on an upper end of said line post for securing said top rail to the side of the post, said bracket having a side wall adapted to be received in an open upper end of said line post, a top wall one edge of which terminates in a downwardly extending flange adapted to engage said top rail and a projection on said side wall adapted to extend through an opening in said channel type post to support said top rail and terminating in an upwardly extending projection extending into a channel in the underside of said top rail.

4,114,861

FENCE RAIL CONNECTOR

Clyde A. Long, 7106 Pony Tail La., Hyattsville, Md. 20782

Filed Sep. 16, 1977, Ser. No. 833,951
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—67 **3 Claims**



1. In a post and rail fence, rail supporting brackets consisting of a single strip of metal bent at right angles to form a horizontal base with two parallel walls extending upwardly an equal distance, the upper horizontal edges being curved inwardly to retain a nail driven horizontally into the post, the center of the

base being curved downwardly in a semicylinder extending horizontally parallel to the upper curved edges and of a sufficient depth so that a nail driven along it would be below the horizontal plane of the base, whereby said bracket is attached to the post solely through its sides and bottom.

4,114,862

PROCESSES AND INSTALLATIONS FOR MELTING PIG-IRON IN A CUPOLA FURNACE

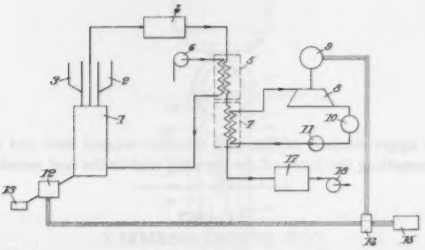
René Denjean, Pavillon-sous-Bois, France, assignor to Air Industrie, France

Filed May 23, 1977, Ser. No. 799,284

Claims priority, application France, May 26, 1976, 76 16075

Int. Cl.² F27B *1/22*

U.S. Cl. 266—44 **5 Claims**



1. In a process for melting pig-iron for subsequent casting in an installation comprising a cupola furnace the improvement comprising:

subjecting the waste gases from said cupola furnace to combustion to form flue gases;

recovering at least a portion of the heat from said flue gases in a thermodynamic circuit;

utilizing said thermodynamic circuit to generate electricity by means of at least one rotary machine coupled to at least one electric generator;

adjusting the proportion of coke in the charge to the cupola furnace to regulate the superheating temperature of the pig-iron leaving the cupola furnace at a valve between the melting temperature of the pig-iron and the temperature compatible with said casting; and

supplying a portion of said electricity to a superheating furnace between said cupola furnace and the casting operation to complete heating said pig-iron leaving the cupola furnace to the temperature compatible with the casting operation.

4,114,863

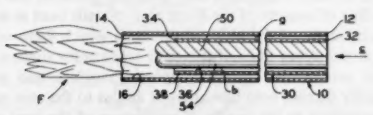
THERMAL TORCH AND METHOD

Patsie Carmen Campana, 2614 Sherwood Dr., Lorain, Ohio 44053

Filed Mar. 11, 1977, Ser. No. 776,582

Int. Cl.² B23K *27/00*

U.S. Cl. 266—48 **10 Claims**



5. In a thermal torch of the type employed for boring, cutting, burning and the like of hard base materials wherein said torch includes a first smooth outer walled elongated hollow casing having inlet and discharge ends and at least one burning rod member extending therethrough generally coextensive therewith between said inlet and discharge ends with at least one first gas flow passage provided between said at least one rod and first casing longitudinally over the coextensive lengths thereof and wherein a gas flow is selectively introduced under pressure into said first gas flow passage at least adjacent said first casing inlet end for promoting a thermic action for said lance in said at least one rod and first casing at said first casing discharge end, the improvement comprising:

a second smooth inner walled elongated hollow casing having inlet and discharge ends received over said first casing in a surrounding relationship therewith, said second casing including means for fixedly mounting it relative to said first casing such that the inlet and discharge ends of said casings are generally coextensive with each other, said second casing further having an inner cross-sectional dimension greater than the outer cross-sectional dimension of said first casing such that a second gas flow passage is defined therebetween generally longitudinally over the cooperative lengths thereof and which second gas flow passage at least substantially surrounds said first casing in a continuous manner, said second gas flow passage being operably connected to said gas flow for generating a gas curtain flowing axially outward of said lance at said first and second casing discharge ends to substantially surround the first casing discharge end in a continuous manner for confining and intensifying the thermic action of said lance at said one rod and first casing discharge end.

4,114,864

DEVICE FOR REMOVAL OF SMOKE GASES, DUST AND THE LIKE

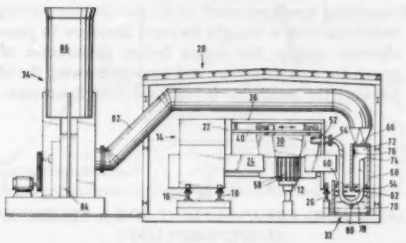
Albert Jäger, Rommelhausen; Alfred Lucht, Bickenbach, and Gerhard Münch, Frankfurt am Main, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Oct. 20, 1976, Ser. No. 733,993

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1975, 2548078

Int. Cl.² B23K *7/06*

U.S. Cl. 266—51 **11 Claims**



1. In a movable scarfing device for scarfing workpieces such as slabs, blocks and the like, having a scarfing machine with a scarfing torch movable in a longitudinal scarfing direction for movement over the workpiece being scarfed and with a suction hood being mounted in front of the torch with respect to the scarfing direction and movably therewith for removing smoke gases, dust and the like during the scarfing operation, the improvement being a frame movable mounted across said scarfing direction perpendicular thereto, said suction hood being mounted to said frame for movement perpendicular to said scarfing direction, an elongate trough mounted in said scarfing direction for being besides and parallel to the workpiece, said trough being divided into an inlet opening and a closed chamber communicating therewith, a sealing liquid in said trough, a U-shaped duct extending from said suction hood through said inlet opening and said U-shaped duct being opened into said closed chamber, a second duct connected at one end to the interior of said closed chamber, said second duct having its opposite end as a free end, said free end having a

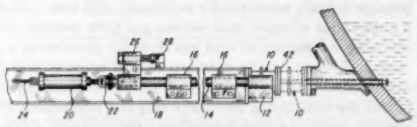
filter apparatus therein and being vented to the atmosphere, and at least one chain curtain which reaches to the workpiece being scarfed being mounted inside said suction hood.

4,114,865

SILENCER FOR USE ON TUYERE PUNCHERS

George C. McKerrow, Toronto; Albert Pelletier, and Peter L. Fowler, both of Noranda, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Jul. 7, 1977, Ser. No. 813,528
Claims priority, application Canada, Mar. 10, 1977, 273691
Int. Cl.[2] F27B *7/36*
U.S. Cl. 266—136 8 Claims



1. A silencer for use with a tuyere puncher comprising:
(a) a chamber having a front face and a rear face provided with a central opening for passing of a punch bar operated by said puncher;
(b) a plurality of closure members adjacent the rear face of the chamber and mounted for movement toward and away from the longitudinal axis of the chamber and including means for forcing the closure member against the periphery of the punch bar so as to form a seal between the closure members and the punch bar;
(c) a seal secured to the front face of the chamber for engaging the tuyere to seal the tuyere before penetration of the punch bar through the tuyere;
(d) a mobile table slidably mounted on the puncher for supporting said chamber; and
(e) operating means mounted on the puncher for pushing the mobile table in a straight forward direction to press the chamber against the tuyere before penetration of the punch bar into the tuyere and for withdrawing the chamber after the punch bar is retracted from the tuyere.

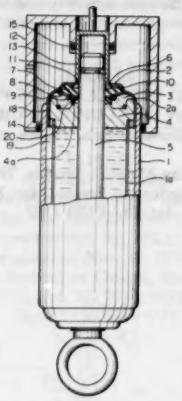
4,114,866

GAS FILLING ARRANGEMENT FOR A TELESCOPIC SUSPENSION UNIT

Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jun. 10, 1977, Ser. No. 805,575
Claims priority, application Japan, Jun. 19, 1976, 51-72511
Int. Cl.[2] F16F *9/43*
U.S. Cl. 267—64 R 5 Claims

1. A telescopic suspension unit comprising a cylindrical container for containing a fluid under pressure, a rod projecting from the upper end thereof, a seal member normally abutting against the inner surface of the upper end of the container and in sealing and sliding engagement around said rod, a spring directly engaging the seal member for urging the seal member against said inner surface of the upper end of the container, the upper end of the container having an opening therein through which said rod extends and having a size for leaving a clearance around the periphery of said rod for allowing insertion of a pressing tool between the periphery of said rod and the edge of said opening for displacing the seal member downwardly against the spring force of the spring to move it away from the upper end of said container to form a gas filling passage between said inner surface of the upper end of the container and the upper surface of the seal member, and a washer attached to



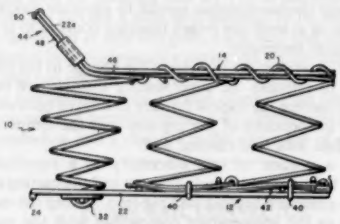
the upper surface of the seal member around said rod for transmitting the force of the pressing tool to the seal member.

4,114,867

COIL SPRING ASSEMBLY

Hamlin Andrus Pakradooni, Webster, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Continuation of Ser. No. 725,037, Sep. 20, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,725
Int. Cl.[2] F16F *3/04*
U.S. Cl. 267—97 1 Claim

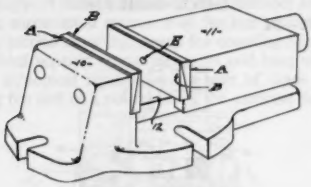


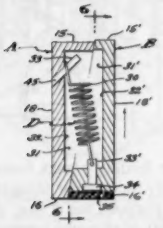
1. An upholstery spring comprising a base, a superimposed spaced parallel border wire, a plurality of equal length upright helical coil springs disposed in transverse rows between the base and border wire parallel to the front and back of the assembly, said border wire at the line of centers of the front row of coils at opposite ends of the front row of coils being bent upwardly at angles greater than the angle of inclination of the helical angles of the coils, and the top loops of said coils of the first row of coils having rear and forward portions bent relative to each other such that there are portions rearwardly of the line of centers of the front row of coils bent at substantially the angle of the helix of the coils which form with the loops at the upper ends of the coils rearwardly thereof a substantial part of the cushion-supporting surface and portions forwardly thereof bent upwardly at angles to the rear portions corresponding to the angles of inclination of the bent up portions of the border wire at the opposite ends of the first row, which collectively define an upwardly inclined shoulder rising from the planar surface of the center line of the centers of the front row of coils for constraining forward movement of the cushion relative to said planar surface and means connecting the upper ends of said upwardly bent portions of the loops of the first row of coils to the border wire.

4,114,868
WORK ALIGNING VISE JAW

Daniel Wm. Smith, 1518 Euclid St., Santa Monica, Calif. 90404

Filed Jan. 9, 1978, Ser. No. 868,065
Int. Cl.[2] B23Q *3/02*
U.S. Cl. 269—136 16 Claims



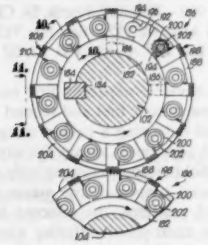


1. A work aligning jaw for a machine vise, including; a mounting member with means for securement to the vise, and a floating member carried on the mounting member and slideably engaged therewith at a plane downwardly and outwardly inclined with respect to a work piece to be clamped in said vise, at least one chamber opening into one of said jaw members and spaced within the boundaries of the slideably engageable inclined plane thereof, bias means confined within the chamber and yieldingly urging the floating member together and upward with respect to the mounting member, and stop means limiting said upward movement of the floating member, whereby the work piece being clamped by the floating member is drawn downward to the vise.

4,114,869
MECHANISM FOR EFFECTING INTERLOCK OF MULTIPLE SHEET CONTINUOUS BUSINESS FORMS

Dean E. Gladow, and Kenneth C. Clifton, both of Emporia, Kans., assignors to Didde-Glaser, Inc., Emporia, Kans.

Filed Mar. 28, 1977, Ser. No. 781,669
Int. Cl.[2] B41L *43/12*
U.S. Cl. 270—37 21 Claims



11. Apparatus for interlocking the plies of a multiple-ply web moving along a path of travel, said apparatus comprising:

at least one pair of opposed interlock dies respectively disposed adjacent the opposite faces of said web,

each of said dies including a blade set having a plurality of spaced, side-by-side, web-shearing and displacing blades each having an elongated outer end extending between narrow side margins;

means for supporting said dies with the blades thereof with the elongated direction generally transversely oriented relative to the direction of travel of said web; and

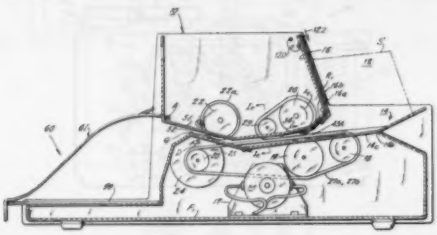
each of said blades having a paper penetrating outer web shearing and displacement section which projects above said side margins of the respective blade;

means for shifting at least one of the dies for causing the blades of said pair of dies to engage, shear-penetrate and deform said web with at least partial interfitting of the blades of the dies during said web penetration and deformation, the blades of said opposed die sets being of a height to provide substantially equal support for the web with only said outer shearing and displacement sections thereof penetrating the web in order to create a series of shear-cut interlocking strips which are connected at opposed ends to the web, with adjacent strips extending substantially an equal distance in opposite directions from the major plane of the web.

4,114,870
DOCUMENT HANDLING AND COUNTING DEVICE HAVING GUIDE FINGERS FOR FACILITATING THE FEEDING OF CURLED, FOLDED AND CREASED DOCUMENTS AND FURTHER HAVING IMPROVED OUTFEED STACKER MEANS FOR FACILITATING THE NEAT STACKING OF DOCUMENTS OF THE AFOREMENTIONED TYPE

John A. Di Blasio, Pennsauken, N.J., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Jul. 12, 1976, Ser. No. 704,467
Int. Cl.[2] B65H *3/04*
U.S. Cl. 271—35 24 Claims



1. Guide means for use in a document handling device adapted to separate a stack of documents presented to the device and to restack the documents after separation thereof, said device comprising:

an infeed hopper for supporting a plurality of sheets generally arranged in a stack;

said hopper having an outfeed passageway at one end thereof through which at least the bottom sheet may pass;

the base of said infeed hopper including continuously moving closed loop conveying means having an elongated upper run positioned to one side of the outfeed passageway such that the upstream portiön of said upper run protrudes at least partially through said opening for advancing at least the bottom sheet of said stack toward and through said outfeed passageway;

continuously movable closed-loop stripper means including a pair of closely spaced stripper surfaces being arranged adjacent to and to the opposite side of said outfeed passageway and having an elongated lower run positioed adjacent to an intermediate portion of the upper run of said conveying means, said lower run being moved in a

direction opposite the upper run of said conveyor means and engaging passing sheets for permitting only a single sheet passing between said stripper means and said conveyor means to be advanced toward said outfeed location;

said closed loop stripper means and said closed loop conveying means cooperating to impose a corrugated shape to the sheets to permit only that sheet which makes sliding engagement with the upper run of said conveying means to be fed towards the outfeed location and in the event of multiple sheets being fed therebetween, enabling only the bottom-most sheet to move beyond the downstream end of said stripper means in moving toward the outfeed location;

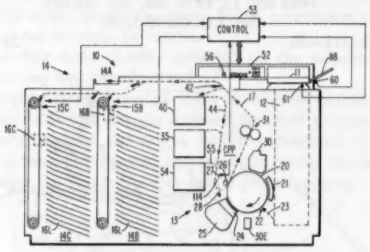
guide means comprising a resilient assembly including a guide member positioned in front of said stripper means and having an inclined surface positioned above the upper run of said conveying means for engaging the downstream edge of documents before they engage the stripper means, to fan the documents as they move towards said stripper means and having a free end positioned between the stripper surfaces for urging the downstream edges towards the upper run of said conveying means to facilitate separation and counting, said inclined surface portion being adapted to yield to prevent documents from being jammed between the guide means and the conveying means.

4,114,871

COLLATION CONTROLS

Anthony Joseph Botte, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1977, Ser. No. 794,327
Int. Cl.[2] B65H *39/10*
U.S. Cl. 271—173 **10 Claims**



1. A copy production machine having an original document transport for positioning an original document in an imaging position, a cyclable copy production portion for producing copies of an original document in said imaging position, an output portion including a collator having relatively movable copy distributor and collator bins whereby relative movement therebetween effects a collation of copies produced by said copy production portion and having a home position and constructed to normally collate in an away from home direction, the improvement including in combination:

means in one of said portions indicating end of a copy producing run,

means detecting an original document to be transported by said original document transport for indicating an immediate new copy run, and

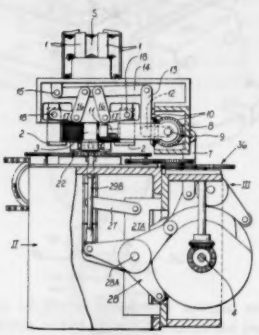
collator control means including a first means jointly responsive to said end of run indication to actuate said collator to relatively move said distributor and bins to said home position and a second means responsive to said immediate new run indication to override said first means actuation for actuating said collator to collate in a going home direction.

4,114,872

BLANK FEEDING

Robert William Davies, and Peter Ernest Willett, both of London, England, assignors to Molins Limited, London, England

Filed May 25, 1977, Ser. No. 800,495
Claims priority, application United Kingdom, May 28, 1976, 22253/76; Dec. 10, 1976, 51612/76
Int. Cl.[2] B65H *3/40*
U.S. Cl. 271—91 **6 Claims**



1. Apparatus for feeding blanks from a stack, each blank being of substantially rectangular elongate shape and having a pair of short edge portions and a pair of long edge portions, comprising a plurality of retaining means at the exit of the stack engageable with edge portions of the lowermost blank at said exit, a plunger device movable into contact with the lowermost blank in a direction substantially perpendicular to the plane thereof, said plunger device having at least two tiltably inter-connected sections each of which has means for gripping an end part of the blank, and drive means operable to tilt one section relative to another so that opposed edge portions of said lowermost blanks are progressively released from the remaining blanks in the stack, and operable then to withdraw said plunger device so as to separate said lowermost blank fully from the stack, said plurality of retaining means comprising a first pair of pivotal claws disposed at opposite sides of said stack for engagement with said short edge portions of said lowermost blank, a second pair of pivotal claws disposed at opposite sides of said stack for engagement with said long edge portions of said lowermost blank, means for pivoting said first pair of claws out of engagement with said short edge portions prior to tilting of said sections of said plunger device by said drive means and for simultaneously pivoting said second pair of claws into engagement with said long edge portions, so that at any time only one of said first and second pairs of claws is in an engaged position.

4,114,873

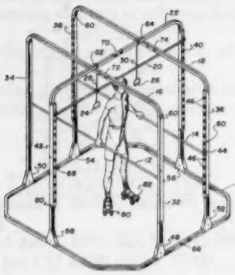
SKATE EXERCISE DEVICE

William C. Jones, 902 - 26th Ave. North, St. Cloud, Minn. 56301

Filed Aug. 10, 1976, Ser. No. 713,150
Int. Cl.[2] A63B *3/00, 23/02*
U.S. Cl. 272—61 **8 Claims**

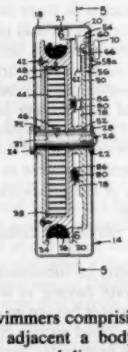
1. An exercise device comprising first and second spaced-apart support frame means; first and second hand-hold means for supporting and balancing a person using the exercise device; first vertical adjustment means for supporting said first and second hand-hold means on respectively associated ones of said first and second support frame means in predetermined adjustable vertical positions, the selected height adjustment operable to cause exercise of differing muscles of the user; third support frame means arranged transverse to said first and second support frame means; third hand-hold means for supporting and balancing a person using the exercise device; second vertical adjustment means for supporting said third hand-

hold means on said third support frame means in predetermined vertical positions above the head of the user; first coupling means for coupling said first and second spaced apart support frame means to said third support frame means for providing structural rigidity; a base member including at least first and second side means for supporting associated parts of said first and second spaced-apart support frame means and said third support frame means, said base member arranged for permitting unrestricted extension of the legs of the user in all directions; second coupling means for coupling said first, second and third support frame means to said base member for providing structural rigidity; and a pair of skate means for supporting the feet of a person using the exercise device, each



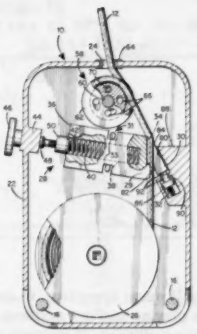
of said skate means including rotatable means for permitting said skate means to be moved in any direction on the supporting surface without lifting said skate means out of contact with said surface, and permitting the user to move the legs in any direction for exercising various parts of the body depending upon the motion of the legs and the level of vertical adjustment of said first and second vertical adjustment means; first adjustable coupling means in cooperation with said base member and second adjustable coupling means in cooperation with said third support frame means, said first and second adjustable coupling means for adjusting and determining the distance between said first and second spaced-apart support frame means for adjusting to the arm span of the user.

4,114,874
APPLIANCE FOR SWIMMERS
Alvin J. Mattila, 2 Beaver St., San Francisco, Calif. 94114
Filed Jun. 27, 1977, Ser. No. 810,686
Int. Cl.[2] A63B *69/12*
U.S. Cl. 272—71 **1 Claim**



1. An appliance for swimmers comprising a housing, means for fixing said housing adjacent a body of water, a shaft mounted in said housing, a spool disposed in said housing and supported for rotation on said shaft, said spool having a side surface substantially normal to said shaft, a flexible tension member wound on said spool and having a proximal end fixed to said spool and a distal end exterior of said housing, means for securing said distal end to the body of a swimmer in a body of water, means in said housing for rotatively biasing said spool in a first direction for winding said tension member thereon, a friction disc supported within said housing for rotation on said shaft, said disc having a first surface parallelly confronting said side surface and a second surface parallelly spaced from said first surface, decoupling means operatively connecting said spool side surface to said first disc surface so that said spool rotates independently of said disc in said first direction of rotation and engages said disc for rotation therewith in the opposite rotative direction, a brake assembly secured to said housing in flanking relation to the outer peripheral margin of said disc, said brake having first and second relatively movable surface defining portions for frictionally engaging respective said disc surfaces, said second surface defining portion of said brake being rigid with said housing, and means for adjustably compressing said surface portions toward one another and into frictional engagement with said disc surfaces so as to afford an adjustable force of friction between said brake assembly and said disc for retarding spool rotation in a direction opposite said first direction, said decoupling means including at least one pawl pivotally mounted to said side surface of said spool radially inward of said peripheral margin and disposed at an acute angle to said surface, means for biasing said pawl toward said first disc surface, said first disc surface defining a plurality of radially extending teeth projecting therefrom toward said side surface for cooperation with said pawl to engage said pawl in a direction opposite said first direction and rotate independently of said pawl in said first direction, said teeth being uniformly spaced around said friction disc and terminating radially inward of said peripheral margin.

4,114,875
FRICTION TYPE EXERCISING DEVICE
Michael E. Deluty, 37 Addington Rd., Brookline, Mass. 02146
Filed Mar. 29, 1977, Ser. No. 782,468
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—133 **5 Claims**



1. In an exercising device including:
(a) a housing having a hollow interior and a cord opening;
(b) a cord retractor reel mounted for rotation within said housing;
(c) rewind means for continuously urging said retractor reel in the rewind direction;
(d) a flexible deformable cord fixed to and wrapped around said retractor reel, said cord running from said reel out of said housing through said cord opening; and
(e) manually adjustable variable resistance friction nip means mounted within said housing between said cord retractor reel and said cord opening for applying frictional force to said cord, said friction nip means including a support member contacting one side of said cord, wedging means mounted on the other side of said cord, first resilient means for continuously urging the wedging means against the other side of said cord to frictionally wedge said cord between said support member and said wedging means as

said cord is pulled out of said housing, said wedging means retracting to unwedge said cord as said cord is retracted into said housing;

(f) said rewind means and said variable resistance friction nip means both cooperating to apply force to said cord to oppose an exteriorly applied manual force pulling said cord in the unwind direction, said friction nip means releasing force on said cord, and said rewind means retracting said cord in the rewind direction in the absence of an exteriorly applied manual force on said cord; and

(g) an improvement to said nip means comprising:

(i) said support member having only a straight cord-contacting surface, said cord only contacting said straight surface over its entire length, and stop means for limiting the travel of said support member in directions towards and away from said cord;

(ii) said wedging means including a wedge member having a substantially smooth and toothless leading portion contacting and frictionally wedging said cord between said wedge member and said straight cord-contacting surface of said support member, said wedge member leading portion engaging and deforming said cord and thereby frictionally retarding the unwinding movement of said cord; and

(iii) said wedging means further including guide means for permitting said wedge member to longitudinally reciprocate along a straight path which intersects with said straight cord-contacting surface of said support member at an angle less than 90°, said guide means including means for limiting and positively halting wedge member travel towards said cord.

4,114,876

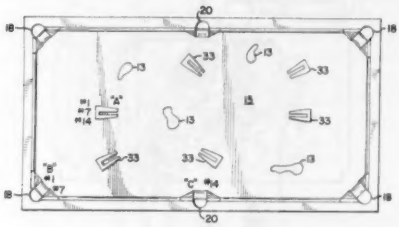
POOL TABLE GOLF GAME

John E. Maruszak, 1247 Home Ave., Berwyn, Ill. 60402

Filed Jul. 28, 1977, Ser. No. 819,673

Int. Cl.[2] A63F 7/06

U.S. Cl. 273—87 B **5 Claims**



1. A simulated golf game apparatus, in combination with a pool table having a playing surface, cushions and pockets, said apparatus comprising a plurality of material sections formed of polyurethane or structural foam, each being positionable adjacent a pocket of said table to form the golf greens of said game with the pockets simulating golf cups, penants attaching to poles formed with a base to simulate golf flags placeable within respective pockets for identifying the pockets as successive golf holes, a plurality of hazard areas randomly disposed on the playing surface simulating bunkers and traps as on the fairways of natural golf courses, a cue ball and object ball, a plurality of tee areas having a shaped cut out section along a portion of the length of said tee forming a bight end and an open end of said cut out, said cue ball placeable at said bight end and said object ball at said open end, said cut out section defining a particular path for travel of said cue ball to strike said object ball for initiating play of said game, whereby players utilizing a conventional pool cue stick propel said cue ball into contact with said object ball from a designated tee area along the path defined by said cut out section, said object ball being directed around said playing surface by said cue ball as in the game of pool for simulating play along the fairways of a natural golf course while avoiding said hazards as in the play of the game of golf, said object ball being moved from a tee area to a correspondingly designated pocket for propelling said object ball into said pocket in the fewest number of shots as possible.

4,114,877

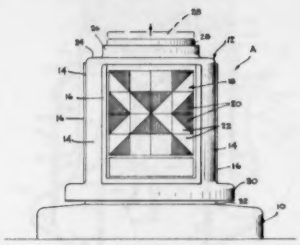
MEMORY SKILL GAME

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Jan. 31, 1977, Ser. No. 764,203

Int. Cl.[2] A63F 9/00

U.S. Cl. 273—1 R **31 Claims**



1. A competitive game for matching designs by players with playing pieces having design portions thereon, said toy game comprising:

(a) a device comprised of

(1) a rotatable member, with a plurality of exterior walls thereon,

(2) means to provide a design of known geometrical shapes arranged to generate certain geometrical patterns on each of the exterior walls of said rotatable member, and

(3) motive means for rotating said member,

(b) a plurality of playing pieces capable of being manipulated by each of the players to recreate a design shown on the rotatable member with said playing pieces, said playing pieces having design portions thereon in the form of known geometrical shapes generally corresponding to the geometrical shapes on the exterior walls of said rotatable member, said designs on said playing pieces also capable of being arranged in certain geometrical patterns so that a design shown on the rotatable member can be recreated, the design portion on said playing pieces capable of presenting design patterns in more than one orientation such that the design portions on said playing pieces will create a geometrical pattern in one orientation and a different geometrical pattern in another orientation, and where for said designs shown on the member not all of said orientations of certain of said playing pieces are proper in relationship to a next adjacent playing piece in that the playing pieces must be selected for the proper design portions and properly oriented relative to other playing pieces to recreate a design of the geometric patterns shown on the rotatable member.

21. A method of playing a competitive toy game, said method comprising:

(a) locating a plurality of substrates on a rotatable member with each substrate having at least one design thereon, each of said substrates having an encoded section thereon and where the encoded section for one player is different than the encoded section for any other player,

(b) assigning each player a particular design and an associated encoded section,

(c) causing said rotatable member to rotate said design into and out of view of at least two competing players located around the rotatable member,

(d) providing each player with an encoded member with the

encoded member for each player being associated with the use of the playing pieces by each of the players, the encoded member for each player being different from the encoded member for each other player and also conforming to the encoded section assigned to each player, and

(e) having the players race with each other in selecting and utilizing three-dimensional playing pieces in order to be the first to recreate his assigned design associated with his assigned encoded section, said playing pieces having design portions on the exterior surfaces thereof, at least two of said surfaces on each playing piece lying in planes which are not parallel to one another, the design portions on some of the surfaces being different than the design portions on other of the surfaces and the playing pieces being orientable in more than one position to create different design patterns, said step of utilizing the playing pieces comprising:

(i) selecting the proper exterior surfaces of selected playing pieces,

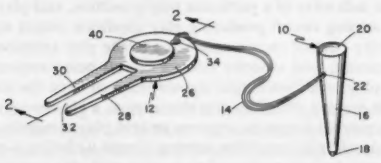
(ii) and orienting the selected exterior surfaces relative to adjacent surfaces in order to recreate the desired design.

4,114,878

ANCHORED GOLF TEE

Robert Louis Hammond, 1051 S. Santa Fe Ave., Vista, Calif. 92083

Filed Jul. 5, 1977, Ser. No. 812,905
Int. Cl.[2] A63B *69/36, 57/00*
U.S. Cl. 273—32 A **7 Claims**



1. The combination of a golf tee and anchor comprising:

a golf tee,

inertial anchor means comprising a green groomer having a mass exceeding that of the tee, wherein said groomer includes a disc shaped body, and a pair of prongs extending from said disc shaped body in the plane thereof,

and a high tensile flexible cord connecting said tee to said anchor.

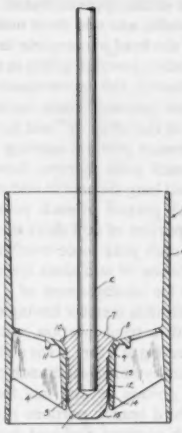
4,114,879

GOLD PUTTING CUP AND FLAGSTICK HOLDING ASSEMBLY

Willard E. Oiler, Winter Haven, Fla., assignor to Menasha Corporation, Neenah, Wis.

Filed Oct. 4, 1976, Ser. No. 729,490
Int. Cl.[2] A63B *57/00*
U.S. Cl. 273—34 R **3 Claims**

1. In combination, a cup to be set into a golf green and having an outer cylindrical wall and a base, said base having a cylindrical central bore and an upwardly and outwardly diverging beveled surface at the upper end of the central bore, and a flagstick assembly including a flagstick and a one-piece ferrule secured to the lower end of the flagstick and adapted to be received within the bore, said ferrule having a downwardly and inwardly converging beveled annular surface disposed in mating engagement with the beveled surface at the upper end of the bore, said ferrule also having an upper annular collar located beneath said beveled annular surface and having a lower annular collar spaced vertically beneath said upper collar, said collars having generally cylindrical outer surface with the outer surface of the upper collar disposed in engagement with the wall of the bore and the cylindrical surface of the lower collar being spaced radially inward of the wall of the bore, said ferrule also including a central cylindrical surface extending between said upper and lower collars, said first and second collars providing a bracing effect against the bore to



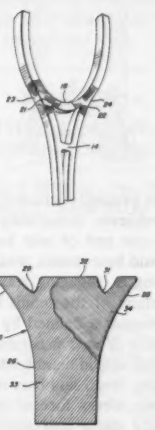
maintain the flagstick in the vertical attitude under heavy wind conditions, said central cylindrical surface having a smaller diameter than said collars to provide a clearance between the central cylindrical surface and said wall of the bore for foreign material.

4,114,880

TENNIS RACKET ASSEMBLY

Andrew M. Cecka, Thousand Oaks, Calif., assignor to Fansteel, Inc., North Chicago, Ill.

Filed Oct. 13, 1977, Ser. No. 841,939
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 G **9 Claims**



1. In a tennis racket frame having a substantially rectilinear cross section with opposite faces and having a handle and an ellipsoid head attached to one end of said handle and a grip element at the opposite end of said handle, in which said frame comprises an assembly of a long structural member and a short structural member, each of said members comprising a core of an expanded porous resinous material and a shell comprising at least one layer of resin coated unidirectionally oriented graph-

ite fibers with said shell completely encasing said core at any cross section transverse to the length of said member, in which frame said long member extends from one end thereof at the grip end of said handle, up one side of said handle, around a major portion of the head of said frame and down the other side of said handle to the opposite end of said member at the grip end of said handle, and said short member extends across a minor portion of the head to complete its ellipsoid shape and is attached at its ends to junction points in said long member in the head portion thereof, the improvement comprising a yoke piece at each of said junction points, each yoke piece having the external shape of the letter "Y" and having a trunk portion and at least two branch portions meeting at a fork point, the trunk portion of each yoke member being at least partially wrapped around said long member in said major portion of said head, a first branch portion of each yoke piece overlying a surface of an end portion of said short member, and a second branch portion of each yoke piece overlying an opposite surface of said end portion of said short member.

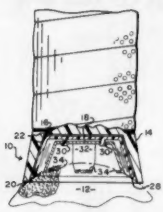
8. A yoke piece for reinforcement of a tennis racket frame comprising a thin, flexible member having the external shape of the letter "Y" with a trunk portion, with two symmetrical branch portions meeting at a fork point and with a third branch portion between said symmetrical branch portions as an extension of said trunk portion beyond said fork point, said trunk portion and said third branch portions being wider than said symmetrical branch portions, and said member comprising at least two layers of resin coated unidirectionally oriented graphite fibers with the direction of the fibers in one of said layers differing from the direction of the fibers in another of said layers.

4,114,881

BALL RETRIEVER

David A. Norton, 1328 S. Michigan Ave., Clearwater, Fla. 33516

Filed Feb. 22, 1977, Ser. No. 770,992
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—73 R 5 Claims



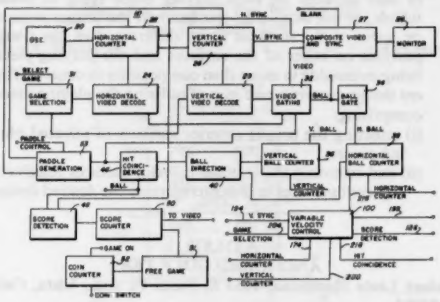
1. A ball retriever primarily intended for use in picking up tennis balls, said retriever comprising: handle means; base means attached to one end of said handle means; and clip means attached to said base means, predetermined portions of said clip means being in engaging relation to corresponding portions of the surface of the tennis ball to be picked up, wherein said base means is defined by a frustrum of a right cone, the smaller side of said frustrum being closed and attached to said one end of said handle means and the larger side of said frustrum being open, said base means further comprising a plurality of tip means formed on the interior of said smaller frustrum side and a corresponding plurality of clip apertures being formed in said clip means whereby said clip means is attached to said base means by inserting each one of said tip means through a corresponding one of said clip apertures, said clip means further comprising a plurality of radially extending arms, the free ends of said arms extending toward said open larger side and having formed thereon said predetermined portions a plurality of hook means disposed in nap-engaging relation to said corresponding portions of said tennis ball surface.

4,114,882

VARIABLE VELOCITY CONTROL FOR PLAYING IMAGES FOR A MANUALLY CONTROLLED ELECTRONIC VIDEO DISPLAY GAME

Theodore A. Mau, Chicago, Ill., assignor to Robert Ralph Runte, Palatine, Ill.

Filed Oct. 29, 1976, Ser. No. 736,951
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—85 G 13 Claims



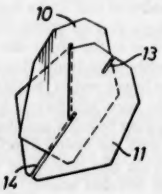
1. A variable velocity control circuit for playing images for use with a manually controlled electronic video game comprising: a play condition sensing circuit, said play condition sensing circuit being adapted to receive playing condition signals from a play condition indicating circuit of the electronic video game indicative of a particular play condition, said play condition sensing circuit producing play condition output signals; a velocity control circuit connected to the play condition sensing circuit, said velocity control circuit being responsive to said play condition output signals received from the play condition sensing circuit to thereby impress a change in velocity on a playing image in response to said play condition output signal; said play condition sensing circuit including a counter, said counter being adapted to receive said play condition signals from the play condition circuit; said velocity control circuit including logic means responsive to the output of said counter for generating said play condition output signals indicative of a plurality of speed ranges of the playing image; and said velocity control circuit including means responsive to said play condition output signals for generating control signals at different rates of speeds corresponding to said play condition output signals.

4,114,883

DART FLIGHTS

Roy Fuscone, 3D Holland Park, London W.11, England

Filed Sep. 12, 1975, Ser. No. 613,014
Claims priority, application United Kingdom, Sep. 12, 1974, 37998/74
Int. Cl.[2] A63B *65/02*
U.S. Cl. 273—106.5 C 11 Claims



8. A dart provided with a dart flight comprising first and second interengaged planar pieces, a dart flight comprising

first and second interengageable planar pieces each providing two wings of the flight when erected and each being symmetrical about a longitudinal axis, a slot defined along the longitudinal axis of the first piece intermediate its ends, two slots defined along the longitudinal axis of the second piece each opening at a respective end of said axis and having an inner, closed, end, said slot in said first piece having substantially the same length as the distance between said inner, closed ends of said slots in said second piece, said pieces being engaged with said second piece passing through the slot in said first piece.

4,114,884
DARTS

Leonard Alfred Tunnicliffe, Walsall, England, assignor to L.A. & E.W. Tunnicliffe Limited, England

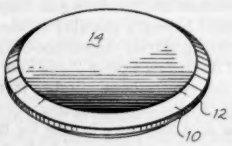
Filed Feb. 15, 1977, Ser. No. 768,721
Claims priority, application United Kingdom, Aug. 24, 1976, 35098/76
Int. Cl.[2] A63B *65/02*
U.S. Cl. 273—106.5 C **6 Claims**

1. A dart having a shaft which is slit at the tail end, a flight of which the wings are directly interconnected at the spine being received in the slits and a pointed metal cap received in openings in the wings and slidably engaging and fitting closely over the slit tail end of the shaft, urging the prongs formed between the slits toward each other and against the flight, the openings having spaced, substantially U-shaped inner and outer edges, the outer edges of the openings being of arched shape substantially conforming to the outer surface of the metal cap, and the inner edges of the openings defining around the spine a tongue which projects into the interior of the cap to locate it positively co-axially with the spine of the flight even when the flight is separated from said shaft.

4,114,885
THROWING DISC

Larry N. Morrow, 10616 Ravenscroft, Dallas, Tex. 75230

Filed Dec. 10, 1976, Ser. No. 749,471
Int. Cl.[2] A63H *27/00*; A63B *65/10*
U.S. Cl. 273—106 B **14 Claims**

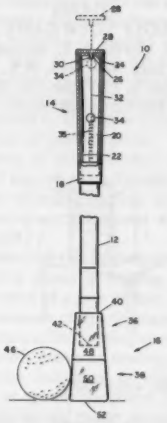


1. A throwing disc comprising:
a. a circular resilient disc of uniform thickness and density,
b. the diameter being about six times the thickness, and
c. the density being about 20 grams per liter.

4,114,886
GOLF CLUB

Bernard C. Koch, 2107 Brandywood Dr., Wilmington, Del. 19810

Filed Sep. 30, 1976, Ser. No. 728,305
Int. Cl.[2] A63B *53/00*
U.S. Cl. 273—162 B **5 Claims**

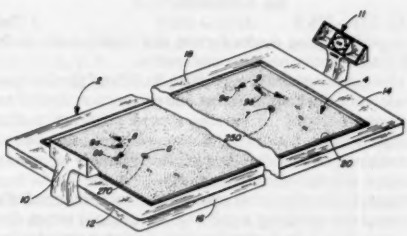


1. Golf club comprising a shaft, a handle means affixed to one end of said shaft, an equally balanced and geometrically shaped club head affixed to the other end of said shaft, and said club head comprising a small trapezoid top portion affixed to said shaft and a large trapezoid bottom portion affixed to said small trapezoid top portion and ends of said large trapezoid bottom portion equally spaced outwardly of ends of said small trapezoid top portion whereby said small trapezoid top portion is symmetrically and equally positioned on top of said large trapezoid bottom portion and faces of said small trapezoid top portion and said large trapezoid bottom portion align to form coplanar continuous ball striking faces providing equal weight distribution of said club head means over the entire length of and circumferentially around said shaft.

4,114,887
GOLF PUTTING GAME APPARATUS

Americo DelRaso, 21858 River Oaks Dr., Rocky River, Ohio 44116

Filed Oct. 1, 1976, Ser. No. 728,526
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 FA **5 Claims**



1. A miniature golf apparatus comprising,
a base member,
a putting surface mounted on said base member,
at least one hole provided in said putting surface,
a plurality of light means operably associated with said

putting surface for indicating the location of commencement of a putt in a direction toward said hole, and

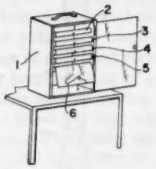
light selection means which, when actuated, automatically illuminates one of said light means at random to provide for random indication of the location of commencement of a putt in a direction toward said hole.

4,114,888

GOLF TOUR GAME

Wayne L. Roseboom, Morris, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1977, Ser. No. 785,735
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 L **1 Claim**



1. A golf tour game, comprising

a carrying case;

a plurality of distinctly different 18 hole golf tournament maps stored in rolled condition in the carrying case on separate rollers whereby a golfer may select and unroll a particular golf course to be played;

a golf ball driving unit for simulating how far a driven golf ball will travel, said golf ball driving unit comprising a housing having an upright shaft rotatably mounted therein, an arm extending substantially perpendicularly from the shaft and having a free end extending in spaced relation with the housing, said arm being freely rotatable with said shaft in a plane substantially perpendicular to the shaft, a golf ball affixed to the free end of the arm, and counting means in the housing coupled to said shaft for counting the revolutions of said shaft and indicating the number of revolutions on a distance scale thereby indicating to a user driving the golf ball with a golf club how far the driven ball travels to a selected hole on a selected one of the maps; and

a marking device for indicating the distance of a drive on a selected map.

4,114,889

GOLF GAME APPARATUS

Fiorenzo Midana, Corso Giovanni Agnelli 48, Turin, Italy

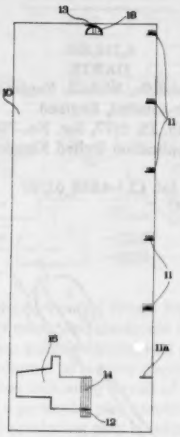
Filed Apr. 11, 1977, Ser. No. 786,100
Claims priority, application Italy, Mar. 2, 1977, 52972/77[U]
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 F **3 Claims**

1. A golf teaching device for use at a location remote from a golf course comprising in combination:

an elongated carpet having a first plurality of parallel spaced reference markings adjacent one end portion thereof and a second plurality of parallel spaced reference markings adjacent the other end portion thereof, the reference markings of said first and second plurality of markings being in longitudinal alignment;

a target device attachable releasably to said other end of said carpet for receiving a golf ball therein, said target device comprising a semi-circular plate having a straight downwardly inclined front edge, the arcuate periphery of said plate being defined by an upstanding wall engageable by and for stopping a golf ball entering the target device, said target device also including a rearwardly extending straightsided projection the sides of which are parallel and spaced apart a distance not greater than the spacing between adjacent ones of said second plurality of reference markings;

and a foot positioning member including a first section presenting a first pair of spaced edges engageable respectively by the insteps of a golfer's left and right feet and a second pair of edges extending substantially perpendicularly of at least one of said first pair of edges engageable by the toes of the golfer's feet, said foot positioning member having a second section including a plurality of parallel reference lines defining a series of golf club swing paths for selection



by the golfer and alignable with corresponding ones of the reference markings of said first and second plurality of reference markings;

whereby a golfer may position said foot positioning member on said carpet in selected relation to said first plurality of reference markings, place a golf ball on one of the reference lines thereon, position the target device so as to be in correct selected alignment with said selected first and second reference markings and thereby properly address the ball with respect to the target device.

4,114,890

REPRODUCTION APPARATUS FOR A GAME

Hiroshi Yamamoto, Kawasaki, and Shigetada Fukuoka, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 14, 1976, Ser. No. 705,125
Claims priority, application Japan, Jul. 15, 1975, 50-85792
Int. Cl.[2] A63F *3/02*; G09B *19/22*
U.S. Cl. 273—237 **3 Claims**

1. An apparatus for reproducing a game having two kinds of pieces, comprising:

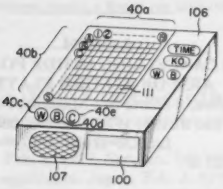
a recording medium on which there is recorded information as to the kind and position of game pieces;

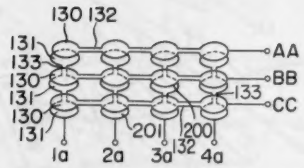
pick-up means for picking up the information from the recording medium and producing an output;

a display board having a plurality of electro-optic display elements arranged over the surface of the board and each capable of displaying a piece of one kind or the other kind, each of the electro-optic display elements comprising concentric circular areas including a central disc area and an annular area forming a border for the disc area, each area being capable of changing from the first appearance to a contrasting second appearance, and electrode means responsive to electrical signals for causing the change in appearance; and

driving means for selectively applying electrical signals to electrode means of selected electro-optic display elements

according to the output of the pick-up means to cause selected electro-optic display elements to display a piece of one kind and to cause selected electro-optic display elements to display a piece of the other kind, the electro-





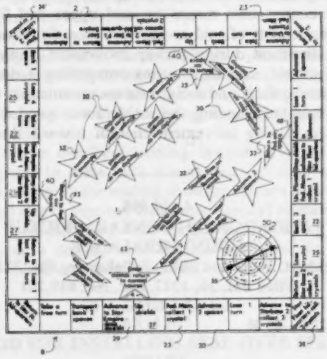
optic display elements for pieces of the one kind having only their annular area assume the second appearance, and the electro-optic display elements for the pieces of the other kind having at least their disc area assume the second appearance.

4,114,891

HAZARDOUS TRAVEL SIMULATING GAME

William T. Lawrimore, P.O. Box 15, North Wilkesboro, N.C. 28659

Filed Aug. 1, 1977, Ser. No. 820,574
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—250 **3 Claims**



1. A chance controlled game apparatus simulating travel through friendly, known territories and hostile, unknown territories, each having various perils, occurrences and events which determine the speed and success of the travel, said game apparatus comprising:

(A) a game board having a substantially planar upper playing surface, a plurality of player pieces manually movable along said playing surface, and a random selection means;

(B) said game board including:

(i) a first circuitous path of player movement delineated along the outer perimeter of said upper playing surface, said first path including a singular starting/finishing point and a plurality of individual, successive, player landing sites therealong having directions printed therein, anticipated occurrences which may alter the normal path of travel, routes, and supplies of critical materials;

(ii) a second circuitous path of player movement including a plurality of individual, successive, player landing sites therealong, each of said secondary landing sites having indicia printed thereon indicative of more unexpected occurrences which may alter the supply of the critical material necessary for continuance of the travel;

(iii) a selected plurality of spaced landing areas in said second path, each of which lies immediately adjacent one of a first group of sapced landing areas in said first path, movement of a player's piece into said second path being determined by the piece coming to rest on one of said first group of landing areas;

(iv) selected ones of the individual landing sites within said first and second paths forming a second group of landing sites including indicia thereon indicative of altered player piece movement along the prescribed paths of travel;

(v) selected others of the landing sites in said first path forming a third group of landing sites having indicia printed indicative of a gain or loss of said critical material for continuance of the simulated travel;

(vi) selected others of the landing sites in said second path forming a fourth group of landing sites having indicia printed thereon indicative of either an attack being launched by or against the player piece;

(C) said random selection means comprising a plurality of separate instructional fields:

(i) a first of said fields further divided into a plurality of instructional segments containing instructional indicia to regulate a prescribed number of areas a player piece moves along one of said first or second paths of movement;

(ii) a second of said fields divided into a plurality of instructional segments regulating the outcome in an attack launched by the player piece as a result of landing on one type of said fourth group of landing areas;

(iii) a third of said fields being divided into a plurality of instructional segments regulating the outcome of an attack launched against one of the player pieces as a result of landing on the other type of said fourth group of landing areas;

(iv) a random outcome means for randomly and simultaneously selecting one of said instructional segments in each of said first, second and third fields to be used during a turn of play in the game; wherein participants travel along a prescribed path of movement determined by instructional indicia on said individual landing sites combined with chance instructional indicia from prescribed ones of said fields randomly selected by said random outcome means.

4,114,892

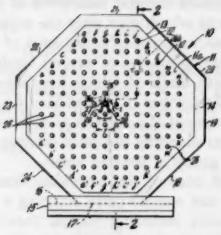
PEG GAME

Frank S. Csoka, Sea Cliff, N.Y., assignor to Fun Things, Inc., New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,202
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—265 **15 Claims**

1. A game comprising, a board, means to support the board in a vertical manner, said board being opaque and being formed with a plurality of holes, a plurality of pegs insertable in said holes so as to extend outwardly on opposite sides of said board, and a member being formed so as to rest on a peg inserted in one hole, at one side of the board, and not visible from the other side, said member being formed with a central portion to be disposed on the peg, and flange portions joined to the central portion and having flange ends extending away from the central portion, so that the ends are spaced from each other, and being dimensioned to permit free fall of the member and said member being so dimensioned and the spacing be-

tween said holes being so dimensioned such that when said holes have pegs therein with the central portion of said member disposed on one of said pegs, said member is freely rotatable and whereby the withdrawal of the peg with the member thereon from the other side of the board causes the member to



fall from the withdrawn peg, and wherein the holes are disposed in a row so that one hole is disposed below another, and wherein another inserted peg is disposed below the aforesaid inserted peg with member so that upon removal of the first said peg, the member drops freely unto the second peg so that the central portion is then disposed on said second peg.

4,114,893

GRAMOPHONE EQUIPMENT

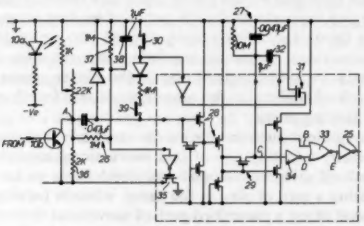
Leslie Alan Leach, Newton of Falkland; Henry Jamieson Riddoch, Leslie, and Neil David Duffy, Glenrothes, all of Scotland, assignors to Pico Electronics Limited, Scotland

Filed Mar. 25, 1976, Ser. No. 670,421

Claims priority, application United Kingdom, Mar. 27, 1975, 13084/75

Int. Cl.[2] G11B *3/06*

U.S. Cl. 274—9 RA **52 Claims**



1. Gramophone equipment comprising a turntable for supporting a phonograph record of the kind having recorded tracks with a relatively high groove density and bands with a relatively low groove density between, preceding and following said tracks, a movable tone arm for supporting a gramophone pick-up, drive means for the turntable and for displacing the tone arm across the turntable from a rest position and also for displacing the tone arm towards and away from the turntable, and control means for controlling the drive means to select recorded tracks of a record in dependence upon the reflectivity of the record, the control means comprising: photoelectric scanning means movable across the turntable for scanning such a record when on said turntable and comprising a source of light to illuminate the record and a photodetector to produce a signal which varies in dependence upon the amount of said light reflected from the scanned portions of such a record, so that the signal comprises signal portions indicative of respective ones of said bands; counter means coupled to said photodetector for counting said signal portions; a signal generator responsive to the position of the scanning means to produce an edge signal when the scanning means reaches a given position corresponding to the edge of a record; and means connected to receive said edge signal for inhibiting the count in the counter from exceeding a count greater than that corresponding to the first of the bands until a time has elapsed after the production of the edge signal which is sufficient for the scanning means to have scanned beyond the first, edge, band into the first recorded track.

4,114,894

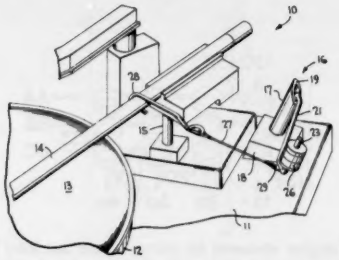
DEVICE FOR CANCELLING INSIDE FORCE OF PICKUP ARM OF RECORD PLAYER

Lenny M. Pelifian, 5 Marie St., Massena, N.Y. 13662

Filed Jun. 6, 1977, Ser. No. 803,644

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **2 Claims**



1. In a record player having an upper surface, a turntable mounted on said surface, a pickup arm mounted on a vertical rotatable rod extending upwardly from said surface, the pickup arm being moveable about the axis of the rod toward and away from the center of the turntable, a device for counteracting the inside force produced on the pickup arm during playback of a record, comprising, a hollow shaft having an upper end and being mountable on said upper surface, a swing arm in pivotal engagement with said upper end, means for interconnecting said arms to effect a following pivotal movement of said swing arm in one direction as said pickup arm moves toward the turntable center, cam means on said upper end for causing pivotal movement of said swing arm in a direction opposite said one direction during pickup movement away from the turntable center, said cam means comprising a downwardly sloping cam surface, and weight means mounted on said swing arm for counterbalancing the inside force produced by the pickup arm during movement thereof toward the turntable center.

4,114,895

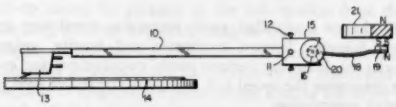
PHONOGRAPH TONEARM PICKUP COUNTERBALANCE

Lewis Eckhart, P.O. Box 2558, Tallahassee, Fla. 32304

Filed Jul. 26, 1977, Ser. No. 819,201

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **11 Claims**



1. In a record player turntable having a base, a record carrier movably mounted on the base, a pickup arm means, means on the base for mounting the pickup arm means for horizontal and vertical movement relative to the base, a pickup device mounted adjacent one end of the pickup arm means remote from the mounting means, the improvement comprising, first magnetic means, means for resiliently mounting said first magnetic means adjacent the other end of the pickup arm means,

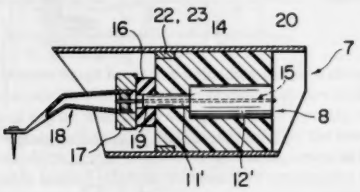
second magnetic means mounted on the base, said first magnetic means being movable relative to said second magnetic means and being vertically spaced relative thereto, each of said first and second magnetic means having opposed face portions of like polarity, whereby the relative polarity of said first and second magnetic means exerts a force on said other end of the pickup arm means.

4,114,896

PHONOGRAPHIC PICK-UP CARTRIDGE

Keniti Okura, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1977, Ser. No. 764,619
Claims priority, application Japan, Feb. 2, 1976, 51-10138
Int. Cl.[2] G11B *3/02*; H04R *1/16*; H01S *4/00*
U.S. Cl. 274—37 **12 Claims**



1. In a phonographic pick-up cartridge sub-assembly including a stylus support member having a generally cylindrical cavity therethrough; an elongated, generally cylindrical sleeve member disposed within the cavity; a stylus support wire axially disposed within the sleeve member, one end of the wire extending out of the sleeve member and being secured to one end of a cantilevered stylus arm, and the other end of the wire being secured within the sleeve member; a magnetic circuit element coaxially mounted to said one end of the stylus arm; and, resilient vibrational damping element disposed between the magnetic circuit element and the support member and adapted to be compressively stressed by tensioning the wire, the improvements characterized by:

(a) the support member being separable along a plane substantially parallel to the axis of said cylindrical cavity to expose said cavity therein, to thereby enable the insertion of the sleeve member into the cavity during assembly,

(b) the support member defining abutment means in the cavity, and

(c) the sleeve member defining abutment means thereon configured to mate with the support member abutment means, whereby the mating abutment means axially fix the inserted sleeve member within the support member so that for a predetermined wire length and damping element thickness, a desired wire tension and damping element compression may be maintained.

4,114,897

METHOD FOR INSTALLING SEAL OVER SPLINED SHAFT

Dean R. Bainard, Bethel Township, York County, S.C., assignor to Garlock Inc., Rochester, N.Y.

Division of Ser. No. 689,038, May 24, 1976. This application Jan. 3, 1977, Ser. No. 756,382
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—1 **10 Claims**

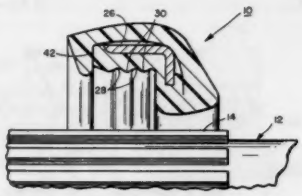
1. A method for installing a seal having a sealing lip over a first portion of a shaft for sealing against a second portion of said shaft, whereby said lip is prevented from contacting said first portion, comprising the steps of:

(a) providing an annular seal having a mounting portion and a sealing lip portion having said sealing lip;

(b) installing said seal over said first portion of said shaft including moving said sealing lip to a non-sealing configuration in which said sealing lip is out of contact with said shaft;

(c) maintaining said sealing lip in said non-sealing configuration and out of contact with said first portion of said shaft during said installing step;

(d) moving said sealing lip from said non-sealing configuration to its normal, sealing configuration in contact with said second portion of said shaft, after said seal has passed



over said first portion and is over said second portion of said shaft,

(e) wherein said seal is made of elastomeric material and wherein said step of moving said sealing lip to said non-sealing configuration includes stretching said sealing lip to a larger diameter than that of said first portion, and

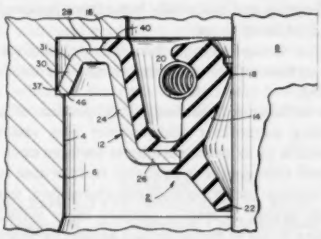
(f) wherein said stretching step includes folding said sealing lip portion over said mounting portion and locking said sealing lip portion to said mounting portion.

4,114,898

OIL SEAL WITH PERMANENTLY DEFORMABLE LOCKING MEMBER

Dean R. Bainard, Bethel Township, York County, S.C., and Roger W. Wright, Kings Mountain, N.C., assignors to Garlock Inc., Rochester, N.Y.

Continuation of Ser. No. 669,669, Mar. 23, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,291
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—9 **21 Claims**



1. An annular shaft seal of the type having a slip fit in a housing bore comprising:

(a) an annular shell including means for positively retaining the seal in a bore, said retaining means including a substantially cylindrical, substantially straight, axially elongated O.D. locking member extending axially outwardly and having a free distal end terminating in an axially outwardly facing locking surface, said locking member being permanently deformable radially outwardly, after said seal has been inserted into a housing bore, from a smaller O.D. to a larger O.D. such that it can be moved radially outwardly into a locking groove of a bore to positively retain the seal in a bore; and

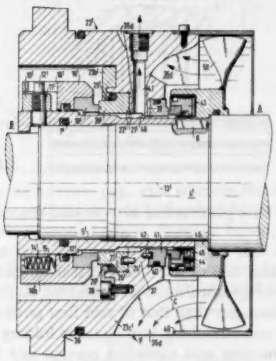
(b) an elastomeric sealing element bonded to said shell and including an annular face gasket extending axially inwardly, said gasket being located axially inwardly from said locking member such that it can provide an O.D. seal for said annular shaft seal.

4,114,899

COOLED MECHANICAL SEAL

Friedhelm Külzer, D-6520 Worms 26, and Ehrhard Mayer, D-8191 Eurasburg, both of Fed. Rep. of Germany

Filed Feb. 13, 1975, Ser. No. 549,550
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408660
Int. Cl.[2] F16J 15/34
U.S. Cl. 277—22 4 Claims



1. A cooled mechanical seal assembly for a shaft passing from the free atmosphere through an opening in a housing wall, comprising,

means defining a primary seal slide ring with a front working surface rotating together with the shaft,

means defining a primary seal counter ring and a sealing housing with said counter ring being mounted in said sealing housing, the sealing housing containing a medium to be sealed and wherein the counter ring is exposed to the medium to be sealed and is fastened so as to be axially non-displaceable and prevented from rotation in the sealing housing and essentially has a front face and peripheral and rear outer faces,

means for spring-forcing a front working surface of the slide ring against said counter ring front face, and further comprising,

means defining a mounting block portion of said sealing housing supporting said counter ring and comprising extension of its outer peripheral surfaces open to ambient air and enlarging it in available surface area accessible to the ambient air by cooling ribs therealong, said mounting block having at least a primary inner surface in direct butting metal to metal contact against peripheral and rear outer faces of the primary seal counter ring,

the primary seal counter ring having an annular shoulder defined by a front step thereof,

the mounting block including a clamping flange portion with a collar end projecting regularly inwardly in annular form and resting via an O-ring gasket against said annular shoulder to seal off the annular shoulder,

and wherein at least the counter ring is made of a material with high mechanical strength, whose heat transfer coefficient is greater than 50 Kcal/m h C.°

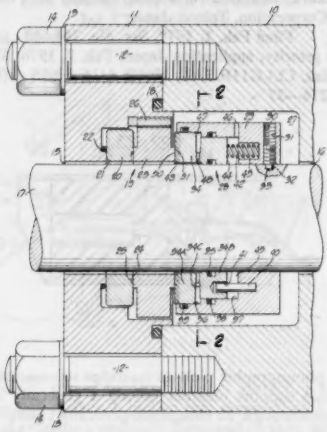
means defining a secondary seal with a slide ring and counter ring on the atmosphere side of the above said primary seal and wherein said mounting block has an inner portion with back to back seats separated by an inwardly extending portion of the mounting block so that the counter rings of the primary and secondary seals are mounted immovably and face in opposite directions, the secondary seal having said slide ring secured to the shaft for rotation therewith.

4,114,900

BALANCED MECHANICAL SEAL WITH FLOW CONTROL

Winfred John Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 615,278, Sep. 22, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,036
Int. Cl.[2] F16J 15/34, 15/48
U.S. Cl. 277—27 15 Claims



1. A balanced mechanical seal assembly comprising:

a housing having a shaft opening;

said housing being exposed at one location to a relatively high fluid pressure and at another location to a fluid pressure less than said relatively high fluid pressure;

a shaft rotatable in said opening;

relatively rotatable mechanical seal means for sealing said opening comprising a first annular seal ring connected to said housing and a second annular seal ring connected to said shaft; one of said seal rings being longitudinally movable;

said annular seal rings having transverse engaging seal faces, the area of one of said faces being greater than that of the other of said faces such that the area free of engagement with the other face is exposed to said location of relatively high fluid pressure;

said seal ring having said greater area seal face being longitudinally movable and having another transverse surface longitudinally spaced from its seal face, said another surface being opposed to and having an area smaller than the area of said one of said faces and being exposed to said location of relatively high fluid pressure, said another surface having an effective area smaller than the bearing area between said engaging seal faces, and the outer diameter of said area free of engagement being greater than the outer diameter of said another transverse surface;

said seal ring having said greater area seal face having yet another transverse surface disposed intermediate its seal face and said another transverse surface and opposed to said area free of engagement, and means communicating said yet another surface with a zone of fluid pressure less than said relatively high fluid pressure;

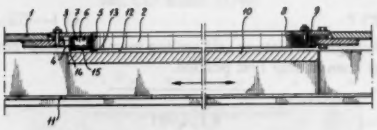
whereby the pressure differential of the fluid pressures on said yet another surface and on said area free of engagement displaces said yet another surface and said area free of engagement in a direction away from said other of said faces.

4,114,901

SEAL FOR UNLOADING HATCH OF HOPPER BARGE OR SIMILAR VESSEL

Hendrik Pot, Alblasserdam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Aug. 19, 1977, Ser. No. 826,182
Claims priority, application Netherlands, Sep. 1, 1976, 7609734
Int. Cl.[2] E06B 7/22, 7/18; F16J 15/46
U.S. Cl. 277—34.3 3 Claims



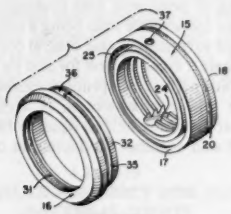
1. In a hopper barge having an unloading opening and a slide movable parallel to the plane of the opening to open and close the opening and an elastic seal surrounding the opening to seal against the slide in the closed position of the slide; the improvement in which the sealing member is inflatable, means to inflate the inflatable sealing member, a channel of rectangular cross-section that surrounds said opening and opens toward said slide, and means mounting said slide for sliding movement in one plane only, with the slide spaced a substantially constant distance from said channel.

4,114,902

SEALING RINGS

David Chester Orlowski, Rock Island, Ill., assignor to Inpro, Inc., Rock Island, Ill.

Filed Oct. 7, 1977, Ser. No. 840,374
Int. Cl.[2] F16J 15/44
U.S. Cl. 277—53 7 Claims



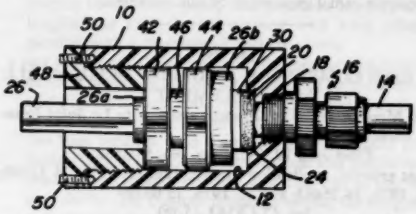
1. Sealing rings comprising:
(a) a first ring member;
(b) a second ring member;
(c) said first ring member having a first radially extending face and a second radially extending face;
(d) said second radially extending face having an annular axially extending recess having parallel inner and outer walls;
(e) said second ring member having an axially extending annular flange having an outwardly facing portion and an inwardly facing portion adapted and constructed to be complementary with said recess;
(f) said flange having at least one annular groove along the outwardly facing portion;
(g) said outer wall of said recess having at least one annular groove; and
(h) an opening from said groove of said outer wall communicating radially and externally of said first ring member.

4,114,903

ROTARY SEAL FOR VACUUM AND PRESSURE SYSTEMS

Robert J. Bovio, Lowell, and Renaldo Mercaldi, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 644,376, Dec. 29, 1975, abandoned.
This application Aug. 15, 1977, Ser. No. 824,420
Int. Cl.[2] F16J 15/34
U.S. Cl. 277—81 R 11 Claims



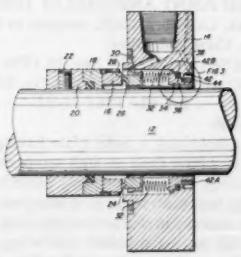
1. A rotary seal device for vacuum and pressure systems comprising:
housing means having a hollow interior;
first and second pipe means respectively entering opposite ends of said housing means and connected thereto, at least one of said pipe means being rotatably mounted within said housing means, the ends of said first and second pipe means within said housing means being axially aligned and spaced apart with one of said pipe means not located within the other;
a ceramic disc-like member having a orifice therethrough and secured adjacent to the end of said first pipe means within said housing means in coaxial alignment therewith; and
an annular member secured adjacent to the end of said second pipe means within said housing means in coaxial alignment therewith and having a spring loaded carbon face portion biased toward said first pipe means, said housing means retaining said annular member coaxially aligned with said ceramic member with said carbon face portion pressed against said ceramic member to provide a rotary seal between said ends of said first and second pipe means, whereby the path through said first and second pipe means is sealed from the hollow interior of said housing means.

4,114,904

BELLOWS-TYPE MECHANICAL SEAL

Robert S. Wentworth, Jr., Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 4, 1977, Ser. No. 839,475
Int. Cl.[2] F16J 15/36
U.S. Cl. 277—88 7 Claims



1. In a bellows-type mechanical seal assembly comprising a

bellows supported by a support ring axially movable with respect to a housing flange and being sealed thereto by a gasket with means to axially move the support ring relative to the housing flange to compress the gasket, the improvement which comprises:

a threaded set screw for bearing against a portion of said housing flange and received in a substantially circular opening partially in said support ring and partially in said housing flange, one of said partial openings being threaded to be engaged by the threads of said set screw and the other of said partial openings being free of threads to constrain radial movement of said set screw.

4,114,905

SEAL RING COMPRISING A HOLLOW DEFORMABLE METAL ELEMENT

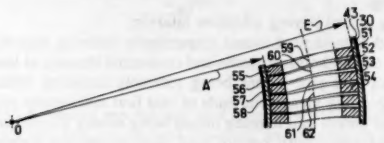
Bernard Mercier, Houilles, France, assignor to Le Joint Francais, Paris, France

Filed Jun. 10, 1975, Ser. No. 585,531

Claims priority, application France, Jun. 26, 1974, 74 22250; Jul. 23, 1974, 74 25463; Feb. 4, 1975, 75 03399

Int. Cl.² F16J *15/00*

U.S. Cl. 277—164 **4 Claims**



1. In a seal ring comprising a hollow deformable metal element intended to be clamped between two surfaces to be applied against each other in a fluid-tight manner and an internal web in the form of at least one spiral spring inside the hollow deformable metal element and flexibly resisting the deformations of the other, the improvement wherein said internal web comprises at least two springs, interwoven with each other and having contiguous turns, with an outside diameter of the winding slightly less than the inside diameter of the hollow deformable metal element, the developed length of the set of spiral springs being a little greater than that of the hollow metal element, so that at the time of shaping, the turns of at least one of the springs move away radially from those of the other, and outwardly thereof, and that after clamping between the surfaces to be applied against each other, the pressure zone of the hollow deformable metal element on the turns of the springs bear on flats formed from a practically continuous line in the upper and lower polar zones of the turns of each of the springs under the effect of clamping to avoid creeping of the deformable metal of the hollow element between the turns of the interwoven spiral springs in the zones of contact of the deformable metal element and the surfaces to be sealed.

4,114,906

SEALED JOINT AND GASKET THEREFOR

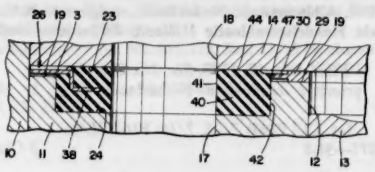
Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 724,955, Sep. 20, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,253

Int. Cl.² F16J *15/12*

U.S. Cl. 277—166 **9 Claims**

1. A gasket comprising a metal plate having a first opening therethrough in which fluid at high temperature may be received and having a second opening therethrough in which fluid at a lower temperature may be received, a sealing member of resilient material in said second opening, said metal plate surrounding said sealing member and being fixedly secured thereto throughout a first portion only of the periphery of said sealing member, the remaining portion of said periphery being unattached to said plate, said unattached portion having no metallic member therein and being located between said openings whereby heat in said first opening is less readily transfer-



able through the plate to said sealing member at said remaining portion than at said first portion.

4,114,907

RESILIENT METAL GASKET

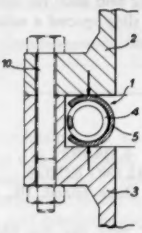
Claude Abbes, Saint Etienne; André Gournier, Saint Priest En Jarez; Christian Rouaud, Bourg Saint Andeol, and Raymond de Villepoix, Donzere, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 2, 1977, Ser. No. 830,194

Claims priority, application France, Sep. 9, 1976, 76 27178

Int. Cl.² F16J *15/02*

U.S. Cl. 277—206 R **3 Claims**



1. A resilient metal gasket comprising a central core formed by a helical spring of metal wire with continguous coils closed on itself and in the inoperative state being a continuous ring, at least one envelope surrounding said central core and having in the inoperative state a cross-section formed by a curve including a gap, said internal helical spring comprising at least one continuous wire whose cross-section is a circular segment having an angle at the centre at least equal to 180° and less than 360°, a chord of said segment producing an outer surface of said spring.

4,114,908

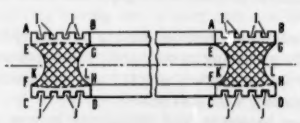
METAL SEALS OR GASKETS

Terence Peter Nicholson, Calf Hall, Muggleswick, Derwentside, Durham, England

Filed Apr. 27, 1977, Ser. No. 791,250

Int. Cl.² F16J *15/06*

U.S. Cl. 277—211 **8 Claims**



1. An annular metal gasket for making a fluid-tight sealed joint between axially opposed parallel surfaces, said gasket having a radially inner face formed with a peripheral groove, a radially outward face formed with a peripheral groove and

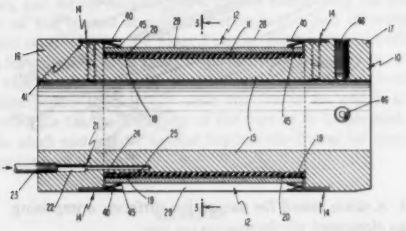
axial end faces intended respectively to engage said opposed parallel surfaces, at least one of said end faces being formed with concentric annular grooves, each of said grooves having a substantially rectangular profile taken in a radial plane.

4,114,909

CORE LOCKING DEVICE

Charles M. Taitel, Parsippany, and Ralph L. Ryan, Lake Parsippany, both of N.J., assignors to JRC Products, Inc., Boonton, N.J.

Filed Mar. 22, 1976, Ser. No. 669,218
Int. Cl.² B23B *31/40*
U.S. Cl. 279—1 Q **7 Claims**



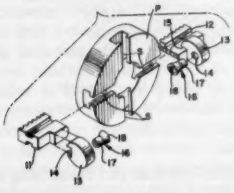
1. An expandable device for locking a bored member to a shaft element comprising in combination a body member having an annular surface adapted to be positioned within the bore, said body having enlarged diameter portions at each end of said annular surface, an annular single-wall expandable bladder covering said annular surface, means for sealing the ends of said bladder to said surface, a plurality of core-engaging bars extending axially along said bladder between said enlarged body portions and positioned side to side around the circumference of said bladder, said bars having longitudinally extending edges, means for introducing fluid medium under pressure between said bladder and said surface to force said core engaging members against the inner surface of the bore, means for locking the core-engaging members against relative rotational movement with respect to said body, and members positioned between said bladder and said bars linking the edges of said bars to limit movement of said bars away from each other in response to inflation of said bladder, said bars being provided with axial grooves adjacent each longitudinal edge on the inner surface thereof and said linking members engage said grooves and extend between adjacent bars.

4,114,910

LATHE CHUCK ASSEMBLY FOR HOLDING UNIVERSAL JOINTS

Marion F. Reeder, 2235 N.W. 41st St., Miami, Fla. 33142

Filed Apr. 19, 1977, Ser. No. 788,912
Int. Cl.² B23B *31/10*
U.S. Cl. 279—123 **6 Claims**



1. An assembly for positioning and holding a universal joint journal cross on a lathe comprising:

a lathe face plate, having a working surface and being circular, said face plate being attached at the center thereof to a lathe turning shaft;

a pair of jaw members mounted on said face plate to be radially movable thereon and to extend outwardly from said face plate;

a pair of base members each attached to one of said jaw members to be disposed at right angles with said face plate working surface and oreinted to be in spaced parallelism with each other, said base members each having an elongate precision bore defined therein to have a longitudinal axis and to be spaced from and radially disposed with respect to said face plate, said precision bore having the longitudinal axes thereof aligned with each other and parallel with a diameter of said face plate;

a pair of universal joint journal cross member supports, each support including an elongate stub shaft received in one of said precision bores and removably secured therein to one of said base members to mount said each support on said one base member, and a pair of hollow conical frustum members each including a longitudinal axis and having the smaller base thereof integral with one end of one of said stub shafts, said frustum members having the longitudinal axes thereof aligned with the longitudinal axes of said stub shafts so that said frustum members are in longitudinal axial alignment with each other, each frustum member being disposed with the hollow portion thereof opening toward the other frustum member with the larger bases thereof being located between the smaller bases thereof;

said stub shafts being received in said precision bores and snugly supported therein to remain in axial alignment with each other thereby retaining said frustum members in longitudinal axial alignment with each other so that said pair of frustum members are oriented to receive trunnions of a universal joint journal cross in a manner which retains a central axis of the cross diametrically oriented with respect to said face plate and thereby retains such central axis diametrically oriented with respect to the turning axis of a lathe turning shaft so that the center of the cross can be aligned and retained in alignment with the turning axis of such lathe shaft.

4,114,911

SKI POLE

Richard Alan Laird, The Lantern House, Chiselhurst, Kent, and Geoffrey Desmond Burnham, 50 Hill View Rd., Orpington, Kent, both of England

Filed Mar. 17, 1977, Ser. No. 778,386
Claims priority, application United Kingdom, Mar. 1, 1977, 8582/77
Int. Cl.² A63C *11/22*
U.S. Cl. 280—11.37 F **1 Claim**

1. A ski-pole comprising an upper tubular section and a lower tubular section adapted to telescope into one another from an extended to a retracted mode, and each of said sections having a free end, a handgrip at the free end of the upper tubular section, a wrist strap associated with the handgrip, a basket mounted on the lower tubular section adjacent the free

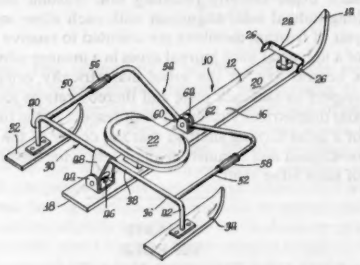
end thereof, and releasable securing means between the upper and the lower tubular sections so that by manipulation of said releasable securing means the upper and lower tubular sections may be telescoped relative to one another to reduce the length of the ski-pole, the handgrip at the free end of the upper tubular section including two separable parts, releasable connecting means between the said two parts to retain the two parts in a first position in which the two parts abut one another and are substantially aligned with said upper and lower tubular sections, pivot means associated with each of the two separable parts whereby the parts may be separated from one another by pivotal movement about said pivot means, and an abutment shoulder associated with each separable part for limiting the pivotal movement of the respective separable part, the abutment shoulders defining a second position in which the two parts are substantially in alignment with one another and perpendicular to said upper and lower tubular sections, the arrangement being such that the ski-pole may be used for skiing in the extended mode and as a seat in the retracted mode by unfolding the two separable parts from said first position to said second position respectively.

4,114,912

SLED APPARATUS

James E. Sweeney, 78 Crescent Dr., Mundelein, Ill. 60060

Filed Oct. 27, 1977, Ser. No. 845,817
Int. Cl.[2] B62B *13/12*
U.S. Cl. 280—12 KL **6 Claims**



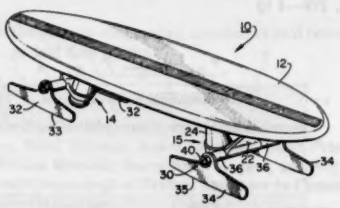
1. An improved sled apparatus for carrying a rider over a snow-covered ground surface, said sled apparatus comprising:
- a main ski having an upwardly curving main ski tip and a main ski body extending longitudinally rearward thereof, said main ski body having an under surface adapted for contacting the snow-covered ground surface and an upper surface;
- a seat carried by the main ski body on the upper surface thereof;
- foot retainer means carried by the main ski body on the upper surface thereof and disposed between the main ski tip and the seat for resting and holding the feet of the rider; and
- a stabilizer assembly comprising:
  - outrigger auxiliary skis, at least one of which is disposed on each side transversely of the main ski body;
  - a stabilizer bar having an upwardly disposed central portion and two downwardly disposed end portions, said stabilizer bar attached at each downwardly disposed end portion to an auxiliary ski;
  - pivot means for yokably mounting the central portion of said stabilizer bar on said main ski body and for pivoting said stabilizer bar about an axis longitudinal of said main ski body; and
  - handlebar means attached to said stabilizer bar substantially near the downwardly disposed end portions thereof and extending forwardly thereof and generally longitudinal of said main ski body for transmitting a selectively applied directional force to the stabilizer bar about said pivot means whereby the direction of travel of said sled apparatus may be controlled.

4,114,913

SKATE BOARD

William K. Newell, 2 N. 715 Morton Rd., and Elizabeth C. Tomson, 3 N. 743 Morton Rd., both of West Chicago, Ill. 60185

Filed May 2, 1977, Ser. No. 792,656
Int. Cl.[2] A63C *1/36, 17/18*
U.S. Cl. 280—12 H **9 Claims**



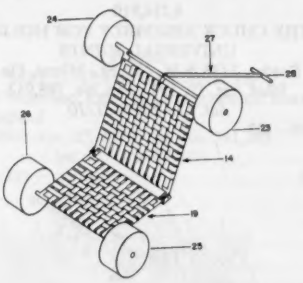
1. A skate board for use on ice surfaces, comprising
- an elongated platform,
- a first pair of runner blades having substantially identical ice engaging edges,
- first means pivotally mounting said first pair of runner blades to said platform near one end thereof with said blades lying in mutually parallel relationship with the longitudinal axis of said platform,
- a second pair of runner blades having substantially identical ice engaging edges,
- second means pivotally mounting said second pair of runner blades to said platform near the other end thereof with said blades lying in mutually parallel relationship with the longitudinal axis of said platform, the configuration of said ice engaging edges of said first pair of runner blades providing a greater resistance to lateral movement on an ice surface than that provided by the configuration of said ice engaging edges of said second pair of runner blades.

4,114,914

FOLDABLE MULTI-PURPOSE CART

Teddy Cohen, 1493 Crown St., Wantagh, N.Y. 11793

Filed Aug. 31, 1977, Ser. No. 829,399
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—30 **5 Claims**



1. A foldable multi-purpose cart comprising elongated members forming a pair of rectangular frames, webbing supported by each of the frames to define respective substantially planar support surfaces bounded by the respective frames, lockable hinge means hingedly connecting the respective frames together, the hinge means including means for locking the hinge

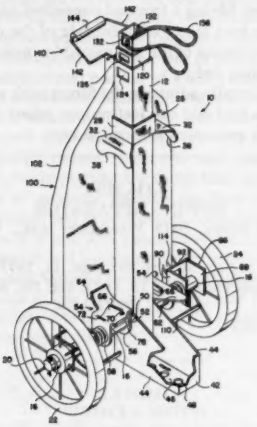
means when the cart is fully open with the frames being angularly displaced from each other by about 180°, two respective pairs of wheels rotatably mounted at the corners of the respective frames remote from the hinged connection of the frames, entirely outside the respective perimeters of the respective frames and extending beyond the respective planes of the respective frames, one of the frames being sufficiently smaller than the other in the dimension normal to the hinging axis to permit the frames to be folded together, without mutual interference of the respective pairs of wheels and without interference of the wheels on each frame with the other frame, into superimposed abutting relationship by relative rotation of the frames in a direction of said extension of the wheels toward each other by about 180° around the hinging axis from the locked, fully open configuration, a shaft and handle for pulling the cart, and means hingedly operatively connecting the shaft to one of the frames at a point between the pair of wheels mounted on the frame, the hinged connection means including means forming a pivotal axis for the shaft substantially parallel to the axis of the wheels for permitting the shaft to be pivoted into superposed relationship with the frame to which it is connected for compact storage of the cart or to be pivoted so that the shaft and handle extend beyond the frame for convenient pulling of the cart.

4,114,915

SKI CADDY

Diane L. Lello, 2517 Dunks Ferry Rd. Apt. A-309, Cornwell Heights, Pa. 19020, and Barry S. Diamond, 1901 Warick Bldg. 3850 Woodhaven Rd., Philadelphia, Pa. 19154

Filed Sep. 17, 1976, Ser. No. 724,169
Int. Cl.[2] B62B *1/06*
U.S. Cl. 280—47.19 **16 Claims**



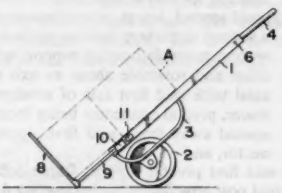
1. A caddy comprising a framework; said framework including an elongated member, said elongated member comprising a plurality of telescopically interconnected elements which are slidably interconnected to each other, and means for retaining said elements in their extended position; a plurality of wheels, said framework including means for rotatably mounting said wheels in spaced relation to each other to one end of said elongated member to enable said caddy to roll over a clear terrain, means connected to said framework for supporting at least one ski boot; a snow support, means for connecting said snow support to said framework so that it lies adjacent to said wheels, said wheels and said snow support being proportioned so that said caddy is supported by said wheels in shallow snow and by said snow support in deep snow; a cup, said cup being connected to one end of said elongated member with its opening in generally facing relation to said interconnected elements so that the heels of skis which are carried thereby are supported by said cup as they lie along the interconnected elements when they are extended.

4,114,916

HAND TRUCK

Shoji Oyama, Chikushino, Japan, assignor to Kuniko Saita, Fukuoka, Japan

Filed May 25, 1977, Ser. No. 800,250
Int. Cl.[2] B62B *1/02*
U.S. Cl. 280—47.29 **5 Claims**



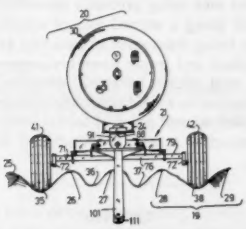
1. A hand truck comprising:
a main frame for supporting a load thereon;
a handle member releasably secured to one end of said main frame;
a pair of wheels mounted on said main frame in longitudinally spaced relation to said handle member for movably supporting said main frame;
a temporary load supporting section carried slidably by said main frame adjacent the end thereof remote from said handle member and having a portion thereof extending substantially perpendicular to the loading surface of said main frame;
a pair of parallel spaced-apart slide bars disposed respectively at opposed sides of said main frame connected at the ends thereof to said temporary load supporting section, each of said slide bars being slidably carried by a support sleeve which is fixedly secured to said main frame; and
a stopper member at the free end of such slide bars for limiting the slide length of said temporary load supporting section relative to said main frame.

4,114,917

TANK TRAILER

Thomas C. Jones, 3603 Westlawn, Amarillo, Tex. 79102

Filed Jan. 16, 1978, Ser. No. 869,717
Int. Cl.[2] B62D *1/02*
U.S. Cl. 280—116 **7 Claims**



1. In a tank trailer having
A. a longitudinally extending frame member and
B. a rear wheel assembly with rear wheels supported on an axle extending transversely to the longitudinal member and a front wheel assembly rotatably connected to said longitudinal member
the improvement which comprises that:
C. said front wheel assembly comprises a first pivotal sup-

port assembly, a second pivotal support assembly and a wheel and frame assembly,

(1) said first pivotal support assembly comprising a first pair of pivotal connectors and a first pivotal support frame,

(a) said first pair of pivotal connectors comprising a first, upper, pivotal connector and a second, lower, pivotal connector,

(i) said first, upper pivotal connector comprising a first stationary bearing surface support and a first movable bearing surface support adjacent to each other and rotatable about a first, vertical axis of rotation for said connectors,

(ii) said second, lower, pivotal connector comprising a second stationary bearing surface support and a second movable bearing support adjacent to each other and rotatable about an axis of rotation coaxial with said first axis of rotation, said second, lower, pivotal connector being located below, and spaced away from, said first, upper, pivotal connector, and

(b) said first pivotal support frame comprising a first rigid post attached to and extending downward from said longitudinal member and a second member attached firmly to said post and extending forward from said post to said second stationary bearing surface support,

(2) said second pivotal support assembly comprising a second pivotal support means and a second pivot support frame;

(a)

(i) said second pivotal support frame having a first, upper, and second, lower, rigid part, each extending in a direction transverse to said first axis of rotation and vertically spaced from each other,

(ii) and a third part extending in a direction parallel to said first axis of rotation and comprising a rigid bar connected to one end of each of said first and second parts,

(iii) and a fourth rigid part extending in a direction parallel to said first axis of rotation and connected to an end of said first part spaced away from said one end of said first part

(iv) said first, upper, part being connected to said upper pivotal connector and

(v) said second, lower, part connected to said lower pivotal connector,

(b) said second pivotal support means comprising

(i) an outer rigid tube and an inner rigid shaft within said tube and resilient members therebetween and extending parallel thereto, said shaft connected to said first and fourth parts of said second pivotal support frame,

(ii) said tube being pivotally movable relative to said shaft along a second axis of rotation, said second axis being transverse to said first axis of rotation,

(3) said wheel and frame assembly comprising a pair of wheels, said wheels rotatably mounted on axles, said axles attached to a rigid cross-bar, said cross-bar extending parallel to said axles of said wheels, said cross-bar firmly attached to said longitudinally extending frame member.

4,114,918

SUSPENSION SYSTEM FOR WHEEL OF A MOTOR BIKE

Peter M. Lutz, Rochester, N.Y., assignor to Parlec, Inc., Fairport, N.Y.

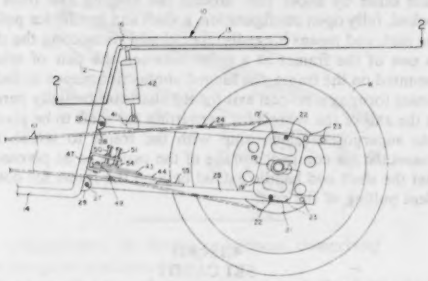
Filed Mar. 18, 1977, Ser. No. 778,847
Int. Cl.[2] B62K *25/04*
U.S. Cl. 280—284 **7 Claims**

1. A suspension system for the wheel of a cycle having a frame and at least one forward and one rear wheel, comprising two pairs of spaced, parallel suspension bars pivoted to the frame adjacent opposite sides, respectively, of the cycle to pivot about a first pair of spaced, parallel axes disposed generally horizontally one above the other when the cycle is in use,

a pair of spaced, parallel plates removably secured adjacent opposite ends thereof to said suspension bars at opposite sides of the cycle for pivotal movement upwardly and downwardly with said bars about said axes,

an axle for one of said forward and rear wheels, respectively, rotatably journaled adjacent opposite ends thereof in said plates to support its associated wheel for rotation about an axis parallel to said first pair of axes, and

first and second means interposed between said frame and



said suspension bars for resisting pivotal movement of said bars about said axes,

one of said means comprising a pair of leaf spring assemblies secured to said frame adjacent opposite sides, respectively, of said cycle,

each of said assemblies having at least one leaf spring fixed at one end and having a free end connected with one of said suspension bars at the adjacent side of the cycle to resist pivotal movement of the last-named bar upwardly relative to said frame, and

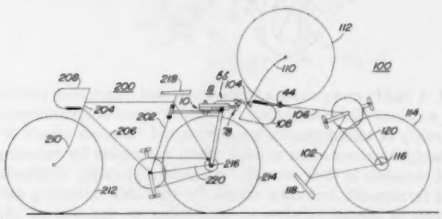
means for manually adjusting the forces with which the free ends of each of said one leaf springs resists pivotal movement of its associated suspension bar.

4,114,919

TOWING APPARATUS

Alan Andrews Stowe, 5415 Winchester Ave., Ventnor, N.J. 08406

Continuation of Ser. No. 786,203, Apr. 11, 1977, abandoned.
This application Dec. 15, 1977, Ser. No. 860,800
Int. Cl.[2] B60D *1/04*
U.S. Cl. 280—292 **27 Claims**



1. A device for towing a first vehicle having at least two wheels by a second vehicle having only one rear wheel, said first vehicle having a frame stem for mounting one of said at least two wheels, said second vehicle having a frame, said rear wheel having an axle by which said rear wheel is attached to said frame of said second vehicle, comprising:

a platform member on said second vehicle, disposed over said rear wheel and attached to said axle and said frame;

a hitch member attached to said frame stem of said first

vehicle, disposed above said one of said at least two wheels;

an intermediate member for connecting said hitch member to said platform member, adapted to slideably rest on said platform member;

first means for pivotally and detachably connecting said platform member and said intermediate member; and,

second means for pivotally and detachably connecting said hitch member and said intermediate member, such that said hitch member is disposed below said one of said at least two wheels, thereby causing said first vehicle to be towed in an inverted position.

4,114,920

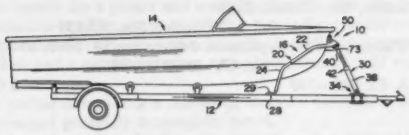
BOAT FASTENING MEANS

Edward G. Boettcher, 254 Corbett St., Clearwater, Fla. 33516

Continuation-in-part of Ser. No. 654,651, Feb. 2, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,613

Int. Cl.[2] B60P *3/10*

U.S. Cl. 280—414 R **12 Claims**



1. A boat fastening assembly of the type primarily designed for use with a boat support, said fastening assembly comprising: cradle means mounted on the boat support, suspension means interconnected between the boat support and the cradle means in at least partially supporting relation thereon, connecting means disposed adjacent the interconnection of said cradle means and said suspension means and in position to lockingly engage a predetermined portion of a boat, biasing means connected to said suspension means and disposed to normally bias said suspension means in supportive movable relation to said cradle means and the boat mounted thereon, orienting means mounted in predetermined relation to said connection means, whereby movable engagement with the boat and said orienting means serves to properly position the boat relative to said connection means; said cradle means comprising at least two arm means; each of said arm means having one end connected to the boat support and having the other end connected to said suspension means; and said two arm means disposed in convergent relationship to one another enabling said cradle means to extend on opposite side of the bow of the boat to supportingly engage the boat being fastened.

4,114,921

VEHICLE HITCH

Rook O. Thorell, and Roger R. Ring, both of Loomis, Nebr. 68958

Filed Sep. 22, 1976, Ser. No. 725,588

Int. Cl.[2] B60D *7/00*

U.S. Cl. 280—478 B **3 Claims**

1. In combination with a vehicle bumper having rearward and forward ends, and a bottom portion,

a horizontally disposed hollow housing having a forward end, an open rearward end, top and bottom portions,

a horizontally disposed tongue member having rearward and forward end, said tongue member having a quadrilateral cross-section,

said tongue member having its forward end selectively movable received by the open rearward end of said housing and being selectively movable from a towing position, wherein the forward end of said tongue member is positioned adjacent the forward end of said housing, to a hitching position wherein the forward end of said tongue member is positioned rearwardly of the forward end of said housing,

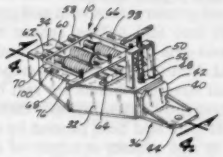
said housing having a horizontal width intermediate its rearward and forward end which is greater than the width of said tongue member to permit the horizontal swinging movement of said tongue member, relative to said housing, when in its hitching position,

means for selectively maintaining said tongue member in said towing position,

a first support rigidly secured to the top portion of said housing and having rearward and forward ends,

a second support longitudinally movably mounted on said first support between said rearward and forward ends,

a spring means interconnecting said first and second supports for yieldably resisting the relative longitudinal movement of said first and second supports,



and means for securing said second support to said bumper,

said housing having a pair of spaced-apart rear side wall portions extending forwardly and outwardly from its open rearward end,

said housing having a pair of spaced-apart forward side wall portions extending forwardly and inwardly from the forward ends of said rear side wall portions,

and a hollow tubular member extending forwardly from the forward ends of said forward side wall portion for receiving the forward end of said tongue member when said tongue member is in its hitching postition,

said hollow tubular member having a quadrilateral cross-section for closely embracing said forward end of said tongue member to prevent lateral swinging of said tongue member when said tongue member is positioned within said hollow tubular member.

4,114,922

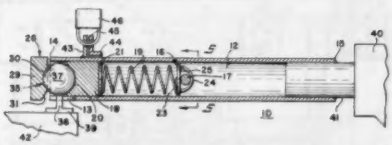
VEHICLE HITCH DEVICE

James E. F. Holbrook, 555 Ward St., Urbana, Ohio 43078

Continuation of Ser. No. 641,153, Dec. 15, 1975. This application May 4, 1977, Ser. No. 793,715

Int. Cl. B60d *11/06*

U.S. Cl. 280—512 **9 Claims**



1. A vehicle hitch device comprising, a draft body having a hollow therein and a notch through said draft body into an opening into said hollow to enable the head of a stemmed head member to be inserted into said hollow through said opening and the stem of said stemmed head member to be inserted into said notch, engagable means of said draft body having an aperture therein for said engagable means of said draft body to be engaged; and means for resiliently pressing and releasably engaging said head of said stemmed head member, the latter said means including, presser and biasing means comprising, rectilinearly movable presser means in said hollow and having

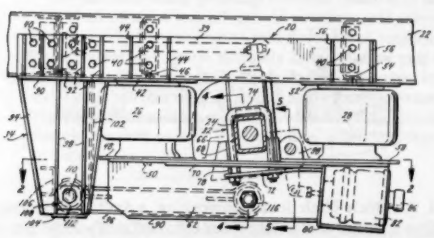
contact structure wherein there is a recess, and means for biasing said presser means to contact said head of said stemmed head member in said recess in said contact structure of said presser means when said head projects outwardly from said hollow through said opening and said stemmed head member is unhitched and is to be hitchingly engaged; and draft thrust transmission means comprising draft head means having contact structure, first and second leg means interconnected by said draft head means having said draft body disposed intermediately of said first and second leg means, and a pin extending through said draft body and connected with said first and second leg means for connecting said draft thrust transmission means to be moved to have said contact structure of said draft head means encounter said head of said stemmed head member with said head of said stemmed head means projecting outside said opening from said hollow during pivotal movement of said draft thrust transmission means under conditions of said head of said stemmed head member being in contact with said contact structure of said presser means in said recess in said contact structure of said presser means with said presser means being thrust inwardly into said hollow against bias of said biasing means while said stem of said stemmed head member is in said notch, and said draft thrust transmission means having a recess in said contact structure thereof for said head of said stemmed head member, by outward movement of said stemmed head member with said head pressed by said presser means in said recess in said contact structure of said presser means under bias of said biasing means, to be in said recess in said contact structure of said draft thrust transmission means outside said opening from said hollow when said draft thrust transmission means is in hitching position, and for said head of said stemmed head member to be retracted from said recess in said contact structure of said draft thrust transmission means by inward movement of said stemmed head member and said presser means against bias of said biasing means, thus enabling pivotal movement of said draft thrust transmission means away from said opening to an unhitching position relative to said stemmed head member, and said draft thrust transmission means further including engagable means forming an aperture and bridging said first and second leg means for said apertures in said engagable means of said draft body and said engagable means of said draft thrust transmission means to receive fastener means when said draft thrust transmission means is in said hitching position.

4,114,923

AIR SPRING AND BEAM SUSPENSION

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Oct. 1, 1976, Ser. No. 728,867
Int. Cl.[2] B60G *11/26*
U.S. Cl. 280—711 **9 Claims**



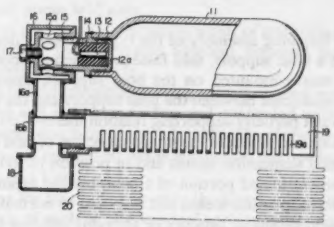
1. A suspension assembly for supporting a vehicle chassis on a vehicle axle comprising a hanger depending from the chassis and rigidly supported thereto to form a member thereof, a beam extending in the generally fore and aft direction located rearwardly of the hanger, means for rigidly mounting the vehicle axle to said beam to define an axle and beam assembly, said beam having spaced apart side walls defining a longitudinal recess extending in the generally fore and aft direction, spring means located rearwardly of said hanger and mounted between said beam and chassis for resiliently resisting movement of the axle and beam assembly during loading and unloading of the axle, and parallelogram means mounted between said chassis and said axle and beam assembly maintaining the pitch of the axle and beam assembly constant during loading and unloading of the axle, said parallelogram means further comprising at least one rod having its forward end pivotally mounted to said hanger and its rearward end pivotally mounted to said axle and beam assembly between said side walls, said rod being received within the longitudinal recess defined between the side walls of the beam to allow unobstructed pivotal movement of the rod upon loading and unloading of the axle, and said beam further having a compartment therein located rearwardly of the rearward pivotal mount of the rod for housing an air brake cylinder.

4,114,924

INFLATABLE BAG APPARATUS FOR PROTECTING OCCUPANTS IN VEHICLES

Takao Kasagi, Okazaki; Satoshi Kuwakado, Nishio, and Toshihiro Takei, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 2, 1976, Ser. No. 702,135
Claims priority, application Japan, Jul. 11, 1975, 50-85668
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—740 **6 Claims**



1. An inflatable bag apparatus for protecting occupants in a vehicle comprising:

a container for pressurized gas having an opening therein, a gas sealing member for closing said opening in a gas fluid-tight sealing manner,

an ignitor disposed adjacent to said gas sealing member for exploding and breaking said gas sealing member into pieces upon a vehicle collision,

a nozzle member having a plurality of apertures for passing the pressurized gas discharged from said container, said nozzle member being connected to said opening adjacent to said ignitor so as to trap relatively large-size fragments produced when said ignitor explodes said gas sealing member,

a first conduit having one end thereof connected to said nozzle member for receiving pressurized gas discharged from said container,

a trapping chamber connected to the other end of said first conduit, having a cross-section larger than that of said first conduit thereby positively trapping therein small sized fragments produced when said ignitor explodes said gas sealing member,

a second conduit having one end connected to said first conduit intermediate the said ends of said first conduit so that the pressurized gas passing through said first conduit is deflected from said first conduit to said second conduit thereby separating from the pressurized gas small sized fragments produced when said ignitor explodes said gas sealing member, and

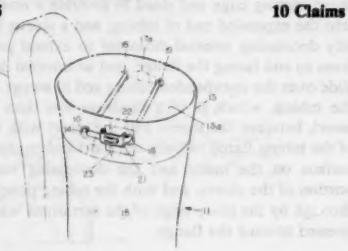
an inflatable bag connected to the other end of said second conduit to receive the pressurized gas discharged from said second conduit.

4,114,925

HOLDER DEVICE

Howard Mathew Burns, 344 E. Hardin, Apt. 8, Findlay, Ohio 45840

Filed Jun. 22, 1977, Ser. No. 808,810
Int. Cl.[2] B42D 17/00
U.S. Cl. 281—45 10 Claims



1. A carrier for a pencil and score card or the like adapted for releasable attachment to a golf club bag and particularly to the upper collar region thereof, said collar including a plurality of eyelets and a peripheral strap extending through said eyelets,

said carrier comprising a one-piece member composed of a principal generally rectangular panel,

said panel including a deflectable central portion defined by a generally U-shaped cut extending through said principal panel, said central portion being deflected slightly upwards from the plane of said panel to define a card-retaining means at the juncture of said central portion with said panel and having a transverse upwardly distorted region spaced from the terminal edge of said central portion to compressingly accommodate a pencil beneath it and the surrounding panel, and

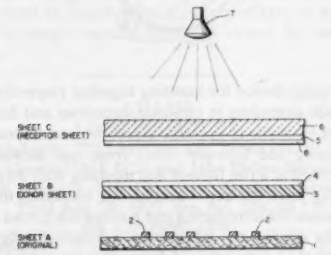
means integral with said carrier for releasable securement to said elongate strap.

4,114,926

BARRIER COAT FOR USE IN THERMOGRAPHIC IMAGING ASSEMBLY

David P. Habib, East Greenwich, and Morgan E. Gager, Warwick, both of R.I., assignors to Trans World Technology Laboratories, Inc., Fiskeville, R.I.

Filed Apr. 19, 1976, Ser. No. 678,455
Int. Cl.[2] B41M 5/00
U.S. Cl. 282—27.5 16 Claims



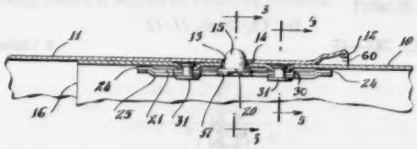
1. An infrared radiation transmitting assembly for use in a thermographic process for producing an imaged transparency corresponding to an imaged original sheet, which comprises an acid donor sheet, a receptor sheet which is receptive to the acid in said donor sheet and reactive therewith to form colored images corresponding to the images on the original sheet, and a substantially infrared transparent, acid-resistant thermoplastic polymeric barrier layer disposed between said donor sheet and said receptor sheet, said barrier layer having a permeability coefficient to water of less than 150 at about 25° C. and permitting diffusion of said volatilizable organic acid into the receptor sheet at thermal imaging temperatures, said acid donor sheet comprising an infrared-transmitting substrate sheet material carrying a layer comprising an organic acid which is volatilizable at the temperature of thermographic imaging and a polymeric binder for said organic acid, and said receptor sheet comprising a clear, infrared-transmitting plastic film carrying a coating comprising a substantially colorless acid-sensitive dye precursor which develops an intense color upon reaction with said acid.

4,114,927

TUBE COUPLING FOR VACUUM CLEANERS

Norman P. Butcher, 702 Sheridan Rd., Normal, Ill. 61761

Filed Jul. 7, 1977, Ser. No. 813,443
Int. Cl.[2] F16L 37/08
U.S. Cl. 285—7 9 Claims



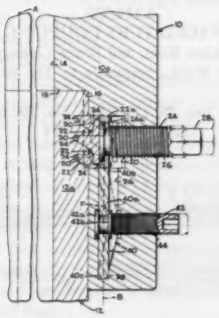
1. A coupling comprising a first rigid tubular member having an open end, a second rigid tubular member having an outer diameter at one end slidably fitting within said open end of said first tubular member, and means for releasably locking said tubular members together comprising first and second alignable holes in said first and second tubular members respectively, a button extending through said first and second holes, and spring means within said second tubular member, said spring means comprising a flat resilient member affixed within said second tubular member at two positions longitudinally spaced in opposite directions from said hole, and having a central portion held to said button, said resilient member having apertures extending therethrough in regions directly between each of said two positions and said second hole, whereby said button is resiliently biased radially outwardly with respect to said second tubular member.

4,114,928

HIGH FORCE CONNECTING MECHANISM

Glen E. Lochte, Cypress, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 10, 1977, Ser. No. 758,225
Int. Cl.[2] F16L 21/08
U.S. Cl. 285—18 14 Claims



1. Clamping mechanism comprising a first member having

two spaced apart abutment surfaces, a second member in overlapping relationship with said first member, a shiftable locking member having a locking position in bridging relationship with said first and second members to hold said members together, said second member and said locking member having teeth for engagement to lock said members together when said locking member is in said locking position, a toggle member mounted in said first member operable when expanded to exert a clamping force from one of said abutment surfaces to the other abutment surface through said locking member and said second member, and means to expand said toggle member.

4,114,929

PLASTIC PIPE OR HOSE CONNECTION FOR FUEL CONDUITS

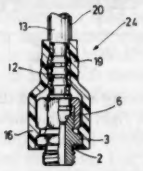
Heinrich Knapp, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 685,802, May 12, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,859

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536017

Int. Cl.² F16L *11/12*

U.S. Cl. 285—45 **6 Claims**



1. In a coupling for plastic tubes or hoses intended for use in fuel conduits of motor vehicles, especially the fuel lines of a fuel injection system, including: a tube engaging nipple; a further nipple; and connecting means for connecting the two nipples, the improvement comprising:

a pipe-like protective rubber sleeve surrounding at least part of the tube engaging nipple and the further nipple and the connecting means, said sleeve having spaced apart sealing means, on either side of the connection of the two nipples, wherein the connecting means and the further nipple together define a sealing space, wherein one of the sealing means comprises an annular protuberance which is received within the sealing space and engages therein the connecting means and the further nipple, and wherein the other sealing means comprises an inwardly elastic tensioning portion of the sleeve adjacent the tube engaging nipple which is capable of adapting to the contour of the surface to which it is affixed.

4,114,930

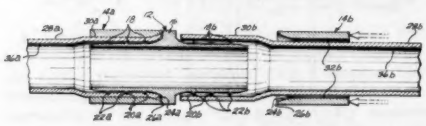
SWAGED TUBE COUPLING

Donald Leroy Perkins, Kent, and Bruce Lindsay Streckenbach, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 28, 1976, Ser. No. 700,677

Int. Cl.² F16L *13/14*

U.S. Cl. 285—334.5 **2 Claims**



1. An apparatus for joining to an end of tubing comprising: tubing expanded to a larger diameter for a distance back from the end; a tubular insert having an outer periphery with a flange, a series of serrations and a surface tapering downward from the flange to the first serration and with the serrations having a side nearest the flange extending radially and the side away from the flange inclined toward the flange to meet on a sharp cutting edge and sized to provide a non-interference fit into the expanded end of tubing; and a sleeve having a gradually decreasing internal diameter to extend part way inward from an end facing the flange, and an internal diameter sized to slide over the unexpanded tubing and to swage and firmly hold the tubing, which is of a hardness less than the sleeve and insert, between the sleeve and the insert with the end portion of the tubing flared radially outward and engaging the tapered surface on the insert and the decreasing internal diameter portion of the sleeve, and with the tubing penetrated part way through by the sharp edge of the serrations when the sleeve is pressed toward the flange.

4,114,931

KNOTTING DEVICE

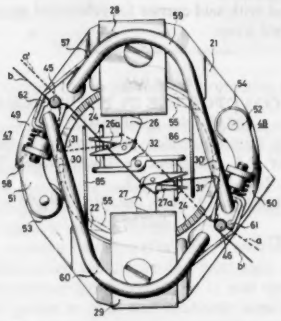
Ivica Romic, Mönchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Germany

Filed Dec. 5, 1977, Ser. No. 857,704

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655042

Int. Cl.² B65H *69/04*

U.S. Cl. 289—2 **7 Claims**

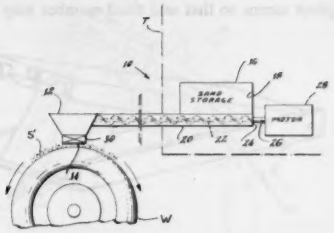


1. In a tying device for knotting together respective ends of two threads extending in opposite directions and having two tying jaws rotatable in opposite directions and disposed mutually opposing and laterally offset from one another, a cup wheel toothed at a rim thereof and meshing with drive pinions of the tying jaws, the cup wheel having entrainers disposed at varying levels for introducing and guiding the thread ends, and serving for driving the tying jaws, a longitudinally shiftable stripper for the knotted thread disposed in the center of the cup wheel, and two thread clamping devices disposed outside the cup wheel, each of the thread clamping devices being controllable and having multiple looping clamps formed with threading contours, a device for equalizing and limiting bearing pressure at looping locations thereof, and a control device comprising a pivotally mounted, controllable two-armed lever having a longer and a shorter lever arm, said longer arm carrying said multiple looping clamps at a free end thereof, and means for transmitting control movements to said shorter arm.

4,114,932
MOTOR VEHICLE WHEEL TRACK SANDING DEVICE

Fred Freeberg, P.O. Box 34391, Omaha, Nebr. 68134

Filed Jul. 5, 1977, Ser. No. 812,914
Int. Cl.[2] B60B *39/06, 39/10*
U.S. Cl. 291—33 1 Claim



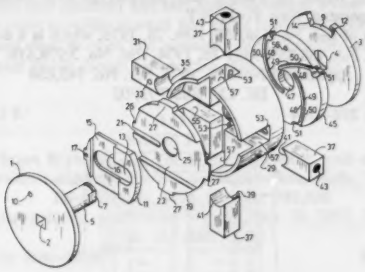
1. A motor vehicle wheel track sanding device comprising:
a sand storage tank forming a storage chamber therein for sand;
at least one hopper mounted over a wheel of said motor vehicle;
a pipe connecting the interior of said hopper with said storage chamber;
auger means rotatably disposed within said pipe, the rotation of said auger means transporting sand disposed within said storage chamber to said hopper;
means for rotating said auger;
said hopper having a sand discharge opening disposed above said wheel and generally longitudinally centered relative to the wheel whereby sand is discharged from said opening onto said wheel and is directed forwardly or rearwardly of the wheel depending on the direction of rotation of said wheel;
valve means on said discharge opening for selectively releasing sand from said hopper;
valve control means remotely situated relative to said hopper and operatively connected to said valve means for opening and closing said discharge opening;
electrical circuit means for activating said rotating means and said valve means simultaneously; and
said electrical circuit means being operative for deactivating said rotating means and said valve means simultaneously, said valve means being closed upon deactivation and said rotating means and auger being slowed to a stop by friction upon deactivation of said rotating means whereby, subsequent to deactivation, a supply of sand is formed at said discharge opening which is closed by said valve means.

4,114,933
LOCK STRUCTURE

Eliezer Jankelewitz, 775 Lawrence Ave. West, Apt. 10, Toronto, Ontario, Canada (M6A 1C2), and John Pinhas Benedict, 7026 Kelder St. Coute St. Luke, Montreal, Quebec, Canada

Filed Aug. 29, 1977, Ser. No. 828,288
Int. Cl.[2] E05C *1/06*
U.S. Cl. 292—37 17 Claims

1. A lock provided with first locking means, second locking means and rotatable operating means for operating said first and second locking means, and operating means being rotatable in both directions from a first position in which said first locking means is spring loaded to remain in a locking position and said second locking means is spring loaded to remain in an unlocking position, the arrangement being such that when said operating means is rotated in one direction from said first position, said first locking means is moved to an unlocking position without disturbing said second locking means and also being such that when said operating means is rotated in the opposite direction from said first position, said first locking

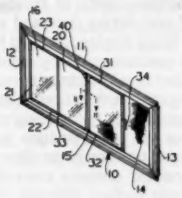


means is maintained in its locking position and said second locking means is moved to a locking position.

4,114,934
HANDLE FOR SLIDING WINDOW

Donald V. Kelly, 15903 Candor Ridge Rd., Canyon Country, Calif. 91351

Division of Ser. No. 513,296, Oct. 9, 1974, Pat. No. 4,004,629.
This application Apr. 23, 1976, Ser. No. 679,798
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—87 3 Claims



1. A handle for moving and locking a moving member with respect to a frame comprising;
(a) a unitary body defining
(b) a handle portion;
(c) a pair of leg portions depending from said handle portion;
(d) the first of said pair of leg portions including a first foot, the underside of said first foot constituting the mounting surface of said handle on the said moving member;
(e) the second of said pair of leg portions including a second foot, said second of said pair of leg portions being spaced from said first of said pair of leg portions at least in the region of said feet;
(f) said second foot including an integral catch for engaging the said frame;
(g) said first and second feet defining a throat region for receiving said frame;
(h) at least one of said leg portions being distortable to allow the engagement and disengagement of said catch with said frame by distortion of said leg portion.

4,114,935

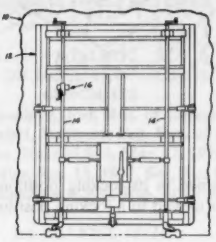
BOX CAR ANTI-PILFERAGE DEVICE

Lowell L. Malo, St. Peters, MO, assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 636,350, Nov. 28, 1975, which is a division of Ser. No. 468,855, May 10, 1974, Pat. No. 3,978,618. This application Nov. 26, 1976, Ser. No. 745,038

Int. Cl.[2] E05C *13/02*

U.S. Cl. 292—104 **5 Claims**



1. A box car anti-pilferage device adapted to be mounted on a railway box car having a sliding door a sufficient distance above the rail whereby the device is usually beyond the reach of thieves standing on the ground adjacent the rail comprising: a door post having a transverse extension including a portion adapted to be engaged by a box car sliding door in closed position; a hasp locking member pivotable mounted about a generally horizontal axis upon one of said box car sliding door and said door post extension; a tripped position plate mounted upon said one of said box car sliding door, and said door post extension; a locking plate mounted on the other of said sliding door and said door post extension; said hasp locking member in locked position engaging said locking plate; said hasp locking member including a cam surface, at least a portion of which is inclined with respect to the vertical; said hasp locking member being manually movable from said locked position to an open position out of engagement with said locking plate; stop means located above said locking plate comprising an outwardly extending stop member made of flexible material mounted upon the other of said sliding door and said door post extension; said member being displaced as said hasp locking member assumes said open position; said stop member maintaining said hasp locking member in said open position during initial movement of said sliding door from a door closed position toward a door open position; means for moving said locking member automatically from the open position to a tripped position engaging said tripped position plate after said sliding door has moved a predetermined distance toward open position; said locking member cam surface effective to cause said locking member to automatically assume a locked position from said tripped position engaging said locking plate without additional adjustment of the anti-pilferage device by the operator when said box car sliding door assumes the door closed position.

4,114,936

IDENTIFICATION OF GEMSTONES BY RELATIVE REFLECTANCE MEASUREMENTS COUPLED WITH A SCALE CALIBRATED IN GEM NAMES

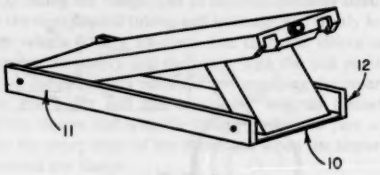
Edward Dominguez, 503 Park Ave., San Jose, Calif. 95110

Filed May 5, 1977, Ser. No. 794,040

Int. Cl.[2] E05C *19/00*

U.S. Cl. 292—342 **2 Claims**

1. A device for limiting the unauthorized opening of a door comprising the combination of an elongated channel shape member having a bottom portion and upstanding side walls; means attaching said member adjacent to the door so that said door must swing over said member when said door is opened, and second elongated channel member having a top portion and depending side walls, pivot means pivotally attaching the side walls of said second member to the side walls of said first mentioned members so that said second member is adapted to be tilted with respect to said first mentioned member whereby said members form a wedge adjacent to said door to limit the unauthorized opening of said door, a third member; second pivot means pivotally attaching one end of said third member to said first mentioned member spaced from said first mentioned pivot means so that said third member may be erected



with respect to said first mentioned member under said second member to hold said second member in said tilted position; said second member having a threaded hole in one end portion thereof; a screw adjustable in said threaded hole, said screw extending to the upper end portion of said third member when said third member is in erect position, said screw gripping said third member and holding said third member in said erect position until released by withdrawal of said screw.

4,114,937

BUMPER ATTACHMENT

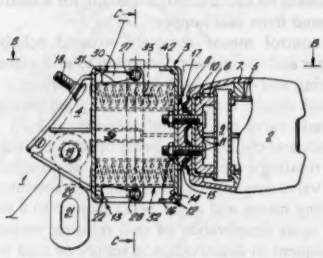
Stig Ivar Norlin, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Dec. 16, 1976, Ser. No. 751,369

Claims priority, application Sweden, Dec. 22, 1975, 7514504

Int. Cl.[2] B60R *19/02*

U.S. Cl. 293—85 **3 Claims**



1. In an arrangement for connecting a bumper unit to a vehicle by means of at least one energy-absorbing, pivotable connecting device, the improvement wherein:

(a) said connecting device comprises two hinge-halves which are pivotally mounted relative to one another about at least one pivot shaft, said hinge-halves comprising base plates (i) securely connected to said vehicle and said bumper unit, and (ii) being arranged to adopt a substantially parallel position relative to one another,

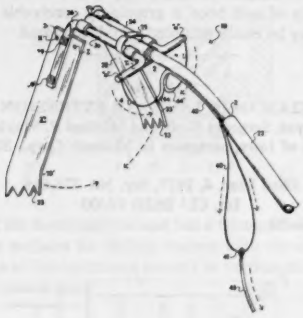
(b) said bumper unit is attached to one of said hinge-halves, whilst the other hinge-half is attached to said vehicle, and

(c) energy-absorbing elements comprising at least one resilient cellular block defining therein elongated cells open at at least one end thereof and arranged between said two hinge-halves, said energy-absorbing elements being arranged so as to permit, by compression, said base plates of said hinge-halves to approach each other both with and without simultaneous pivotal movement to a position in which said base plates are not parallel, said pivotal movement occurring when said bumper unit is subjected to an impact above or beneath its horizontal central plane.

4,114,938
GUTTER CLEANING DEVICE

M. Lane Strader, 910 Hern St., Greensboro, N.C. 27405

Filed Aug. 25, 1977, Ser. No. 827,798
Int. Cl.[2] B25J 1/00; E04D 13/06
U.S. Cl. 294—19 R 5 Claims



1. A device for removing leaves and debris from gutters from a ground position, said device comprising:

a. an elongated extension pole including means for selectively extending said pole to one of a plurality of extended positions;

b. a gripping means mounted at the upper end of said extension pole, said gripping means including:

i. a pair of activating bails each having a primary segment rotatably attached in juxtaposed relation to the upper end of said extension pole, a mounting segment extending substantially perpendicularly from the forward end thereof, and a control segment extending substantially perpendicularly from the rearward end of each of said primary segments;

ii. a pair of gripping blades substantially rectangular in shape, one of said gripping blades being mounted on each of said mounting segments in such a manner that said blades depend downwardly from said extension pole at an angle generally less than 90°;

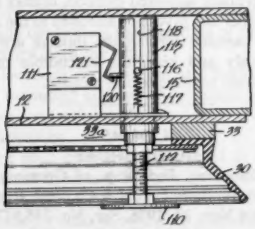
iii. means for adjusting the angle at which said gripping blades depend from said extension pole;

iv. control means for selectively moving said gripping blades from a first, open position to a second, closed position.

4,114,939
VACUUM PICKUP HEAD

Harold S. Burt, Mendota, Ill., assignor to Conco Inc., Mendota, Ill.

Filed Sep. 13, 1976, Ser. No. 723,027
Int. Cl.[2] B66C 1/02
U.S. Cl. 294—64 R 10 Claims

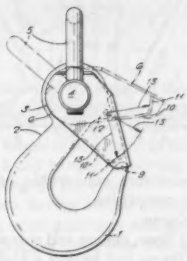


1. A pickup head for vacuum holding of a container comprising, a casing with an interior vacuum chamber and a depending container-engaging seal element to seal the space between said casing and a container, a bottom wall of said casing having a passage to connect said space with said vacuum chamber, valve means for controlling communication between said chamber and said space including a two position valve plate movable toward and away from said bottom wall between passage open and passage closed positions, and fluid-powered motor means for moving said valve plate.

4,114,940
SAFETY HOOK

Jan Jørgen Brynemo, and Tor William Spilhaug, both of Helle, Norway, assignors to A/S Kjaettingfabriken, Helle, Norway

Filed Oct. 29, 1976, Ser. No. 737,030
Claims priority, application Norway, Oct. 29, 1975, 753640
Int. Cl.[2] B66C 1/36
U.S. Cl. 294—82 R 6 Claims

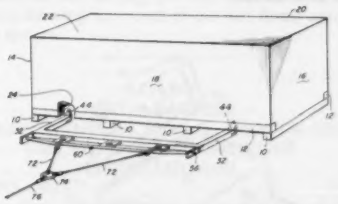


1. A load carrying safety hook comprising a hook portion, a body portion provided with a transverse eye, a pin received in said eye for attachment to a shackle member, a latch adapted to close the gap of the hook and having a substantially U-shaped cross section and mounted on said pin for pivotable movement outwardly of the hook gap for opening and closing the same, a compressible spring inserted in said latch to extend from a transverse wall adjacent the free end of said latch to said hook body at a point whereby said spring in the closed position of said latch extends at an angle to a straight line extending through the axis of said pin to the point on said transverse wall of the latch at which one end of said spring is secured.

4,114,941
CARGO HANDLING DEVICE

Michael H. Heaton, Thurston Rd., Gloucester, Mass. 01930

Filed Jun. 20, 1977, Ser. No. 808,108
Int. Cl.[2] B66C 1/22
U.S. Cl. 294—86 R 4 Claims



1. A crate grappling device comprising

a generally U-shaped frame including a pair of coplanar arms and a cross member interconnecting the arms at one end thereof,

a pair of hook-like members, one secured to the other end of each of the arms and extending in the same direction from the plane of the arms,

a plurality of line anchors spaced along the cross member enabling the user to selectively secure a line to the device,

and a curved skid secured to the ends of each of the arms on the sides opposite the hook-like members,

said skids and hook-like members being formed as an integral unit with the skids defining a radius at the end of each arm, whose center of curvature is parallel to said cross-member.

4,114,942

EXPANDABLE HOUSE TRAILER STRUCTURE

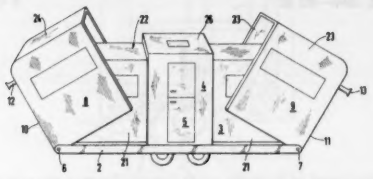
Karl Walter Greiner, Steigstr. 48, D-7321 Aichelberg, Germany

Filed Oct. 20, 1976, Ser. No. 733,984

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1975, 2546959

Int. Cl.² B60P 3/32

U.S. Cl. 296—23 G **5 Claims**



1. A housing structure convertible between smaller and larger living areas comprising:

a base support frame;

a cabin having a floor, ceiling and side walls secured to said base support frame and having a U-shaped member contacting and overlying the ceiling and adjoining side walls defining a flat shoulder or abutment facing one edge of said cabin;

a four sided shell member pivotally mounted to said frame adjacent one end of said cabin or an axis transverse to a longitudinal axis of said cabin, said shell in closed position enclosing said one end, ceiling and side walls of said cabin with its edges remote from the pivot point engaging said flat shoulder and defining therewith a smooth uninterrupted exterior surface, said shell in an open position rotated 90° from its closed position forming an extension of the living area in said cabin; and

a separable roof member positionable to form a roof over said shell in its open position.

4,114,943

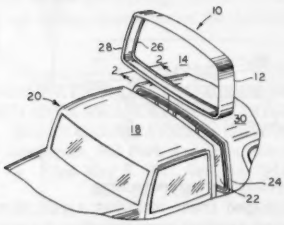
WINDOW BOOT

Thomas Engelhard, 4325 Colfax Ave., South Minneapolis, Minn. 55409

Filed Nov. 2, 1976, Ser. No. 738,313

Int. Cl.² B60D 3/32

U.S. Cl. 296—23 MC **3 Claims**



1. A combination including a boot and frame windows of a cab/camper assembly of the type having a rear frame window in the cab and a corresponding front frame window in the forward wall of the camper, said boot comprising a frame including a continuous resiliently deformable side wall, said side wall defining an aperture corresponding respectively to said windows in said cab and said camper, said side wall terminating in respective opposite ends, said respective opposite ends each including a thickened resilient continuous lip, each of said lips being adapted to be snap-fit into a corresponding window frame for thereby mounting said boot between said cab and camper, each of said window frames including an exteriorly extending substantially U-shaped channel in which a respective lip of said boot is grippingly receivable whereby said boot may be easily mounted and dismounted.

4,114,944

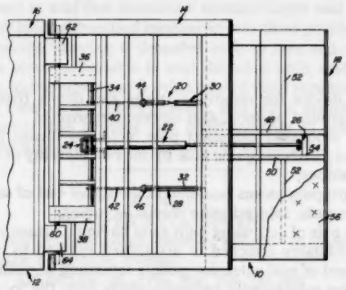
TELESCOPIC TAILGATE EXTENSION

Gerald E. Joynt, Sergeant Bluff, and Michael R. Mayhew, Sioux City, both of Iowa, assignors to Multech Corp., Sioux City, Iowa

Filed Mar. 4, 1977, Ser. No. 774,645

Int. Cl.² B62D 33/00

U.S. Cl. 296—50 **10 Claims**



1. An extendible tailgate assembly for a load carrying vehicle, comprising, in combination:

(a) a tailgate connected to a main frame of a load carrying vehicle;

(b) an extendible member mounted on the tailgate for reciprocating movement relative to the tailgate and varying the extent of the tailgate assembly; and

(c) actuator means mounted on the tailgate and connected to the extendible member for moving same relative to the tailgate, the actuator means including, in combination:

(1) motor means connected to the tailgate and to the extendible member for extending and retracting the extendible member out of and into the tailgate, the latter forming a socket for receiving the extendible member; and

(2) guide means connected to the tailgate and to the extendible member for guiding the extendible member while same is extended and retracted, the guide means including a linkage comprising a pair of spaced, substantially parallel linkage arms pivotally attached to the extendible member, and a torque member extending laterally of the tailgate and pivotally mounted thereon, cranks affixed to the torque member and pivotally attached to the linkage arms, the torque member forcing the linkage arms to operate simultaneously and keep the extendible member on a parallel motion relative to the tailgate.

4,114,945

GUIDE SHOES

Alfons Lutz, Emmering, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Nov. 29, 1976, Ser. No. 745,977

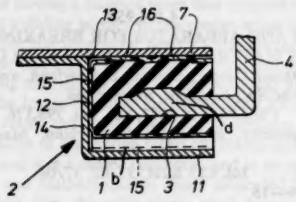
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553549

Int. Cl. B60j 7/10

U.S. Cl. 296—137 E **8 Claims**

1. A sliding roof assembly of a vehicle comprising a rail

having three surfaces defining a U-shaped cross-section within which is guided a guide shoe, said guide shoe being connected with a slidable part of the vehicle roof, and wherein the guide shoe is formed by an elastically deformable body for resiliently



engaging the three surfaces and has a friction-reducing covering on its surfaces for sliding contact with the rail, whereby tolerances in the horizontal as well as vertical directions may be compensated for.

4,114,946

MEDICAL TREATMENT CHAIR

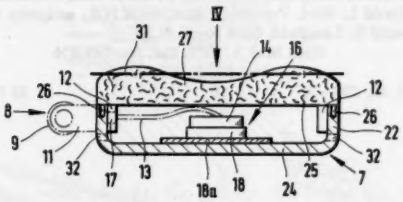
Jurgen Hoffmeister, Biberach, and Martin Saupe, Mittelbiberach, both of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Germany

Filed May 23, 1977, Ser. No. 799,692

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 7617191

Int. Cl.[2] A47C *7/62, 1/02*

U.S. Cl. 297—191 **10 Claims**



1. A medical treatment chair having a seat portion and a back portion and comprising:

switch housings releasably mounted on said back portion;

manually operated switches provided on said housings for electrically controlling the operation of respective parts of or associated with the chair;

mounting locations provided on said back portion and releasably mounting said switch housings;

a respective connecting cable connected at one end to each of said housings;

a respective plug connector connected to an end of each cable remote from said one end;

a respective socket provided within the back portion for engagement by each of said plug connectors;

an access opening in the back portion to permit manual manipulation of said plug connectors and said sockets within said back portion; and removable closure means mounted on said back portion for closing said access opening.

4,114,947

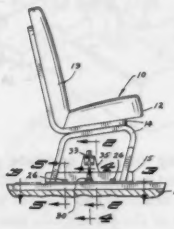
DETACHABLE SEAT MOUNTING FOR BUSES

Eldrid W. Nelson, Minneapolis, Minn., assignor to Chas. Olson & Sons and Wheel Service Co., Inc., both of St. Paul, Minn.

Filed Nov. 18, 1977, Ser. No. 852,924

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—344 **10 Claims**



1. A detachable mounting for securing the frame of a seating device to the floor of a passenger bus, comprising

an elongate anchoring track to be affixed on the floor of the bus, and a base means to be affixed to the seat frame and to overlie the track and having supporting feet and a locking pin thereon to engage the track,

the anchoring track having a rigid bottom and a longitudinally extending open guideway and also having a pair of rigid retainer flanges overlying the guideway and arranged in spaced edge to edge relation to each other and defining an elongate keyway therebetween, the flanges having a plurality of pairs of recesses in the edges thereof at regularly spaced intervals along the track, each pair of recesses being located directly opposite each other and cooperatively defining an enlarged access opening into the guideway,

the supporting feet having enlarged heads in the guideway and in confronting relation with the flanges and also having narrow necks extending through the keyway to the base means, the spacing between the feet equaling the center to center spacing between a pair of such access openings, and the heads being smaller than said openings to pass therethrough, the heads being slidable in the guideway to shift into alignment with openings for removal therethrough, and

the locking pin being removably inserted into one of the access openings of the guideway to prevent sliding of the feet along the track and to maintain the heads in confronting relation with the track flanges, the pin engaging the bearing firmly against the bottom of the track, and pressure means on the base means and applying significant pressure on the locking pin and toward the track and thereby drawing the heads of the feet firmly against the track flanges.

4,114,948

AUTO HEADREST

R. V. Otis Perkey, 1310 SE. 30th Ave., Ocala, Fla. 32670

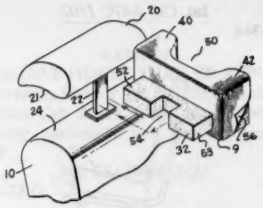
Filed Aug. 3, 1977, Ser. No. 821,582

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—397 **7 Claims**

1. An auxiliary headrest for an automobile seat of the type having a built-in headrest supported by a generally vertically extending standard extending upwardly from the top of the back of the automobile seat, said auxiliary headrest comprising a U-shaped cushion body of relatively soft material including a back cushion portion extending across the rear width of the cushion body and side cushion portions extending forwardly of the ends of the back cushion portion and spaced apart to permit the back of a user's head to be positioned therebetween and a rearwardly extending support member extending rearwardly of said back cushion portion to be positioned between the

built-in headrest and the top of the back of the automobile seat for positioning and maintaining said auxiliary headrest forwardly of the built-in headrest, wherein said support member includes a slot dimensioned to snugly fit around said generally



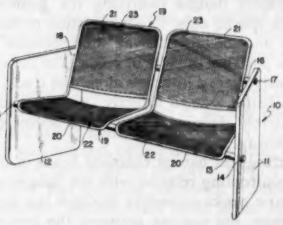
vertically extending standard and side portions on opposite sides of said slot and having an upper surface engaged with the lower end of said headrest and a lower surface resting on the upper end surface of the automobile seat.

4,114,949

SEATING ARRANGEMENT

Roland A. Benoit, Danielson, Conn., assignor to InterRoyal Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,799
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—445 **13 Claims**



1. Free floating chair comprising

a pair of side by side and laterally spaced apart upright end support truss members having corresponding forward, rearward, top and bottom portions and adapted to support a load with the bottom portions thereof resting on a support surface,

a substantially horizontally extending linear structural load bearing seat accommodating suspension rod correspondingly mounted in suspension at its end portions on the forward portions of the end support members at a level intermediate the top and bottom portions thereof,

a substantially horizontally extending linear structural load bearing backrest accommodating suspension rod correspondingly mounted in suspension at its end portions on the rearward portions of the end support members at a level in the vicinity of the top portions thereof,

at least one unitary composite seat and back portion defining a substantially horizontal seat area and a substantially upright backrest area and disposed at an angle with respect thereto,

the rearward back portion and the forward seat portion being interconnected rigidly with each other and, in turn, the forward seat portion being disposed downwardly against and connected to the seat accommodating rod in load transmitting contact therewith and the rearward back portion being disposed rearwardly against and connected to the backrest accommodating rod in load transmitting contact therewith,

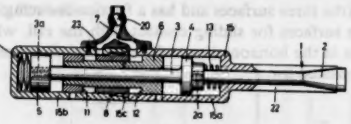
whereby to provide a free floating chair capable of transmitting the load of the user in forward and rearward distributed balance correspondingly via the seat portion and backrest portion to the seat accommodating suspension rod and backrest accommodating suspension rod and in turn in laterally distributed balance correspondingly via the suspension rods to the end support truss members.

4,114,950

METHOD AND APPARATUS FOR BREAKING A HARD COMPACT MATERIAL SUCH AS ROCK OR CONCRETE

George Anthony Cooper, Gollion, Switzerland, assignor to Institut Cerac SA., Ecublens, Switzerland

Filed May 9, 1977, Ser. No. 795,176
Claims priority, application Switzerland, May 25, 1976, 6575/76
Int. Cl.[2] E21C *37/02, 37/04*
U.S. Cl. 299—15 **12 Claims**



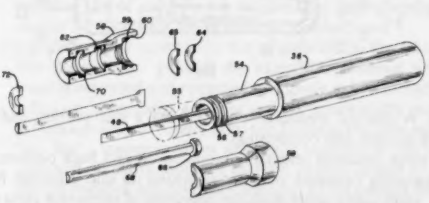
1. In a method for breaking a hard compact material such as rock or concrete including drilling a hole into the material to be broken, gripping a region of the wall of the hole by applying a radially outwardly directed force thereto, and applying an axially outwardly directed tractive force to the gripping region in a direction axially outwardly of the hole and toward the mouth of the hole, said forces being of sufficient magnitude so as to cause cracks to arise in the wall of the hole, the improvement comprising generating at least one of said forces by sequentially repeated axially outwardly directed tractive impacts which are directed axially outwardly of the hole and toward the mouth of the hole.

4,114,951

HYDRAULICALLY ACTUATED TOOL FOR MECHANICALLY SPLITTING ROCK-LIKE MATERIAL

Edward R. Langfield, Glen Rock; James L. Hile, Montville, and David L. Hird, Pompton Lakes, all of N.J., assignors to Edward R. Langfield, Glen Rock, N.J.

Filed May 9, 1977, Ser. No. 795,074
Int. Cl.[2] E21C *37/04*
U.S. Cl. 299—22 **35 Claims**



1. Apparatus for mechanically splitting rock and the like by a sliding wedge which moves between like opposed feathers to move them apart, the wedge and feathers inserted into predrilled holes and the wedge moved by a hydraulic piston, the movement of said wedge being translated into a substantially like sideways movement of the opposed feathers, said apparatus including: (a) a housing apparatus including a hydraulic cylinder having a piston and a piston rod extending from and through one closing end of the cylinder; (b) means for controlling a flow of pressurized fluid selectively to either side of the piston while returning that fluid on the other side of the piston at that instant to a recovery supply; (c) a slider wedge removably mountable and secured to the rod end of the piston and movable with the rod end as it is moved by the piston, the

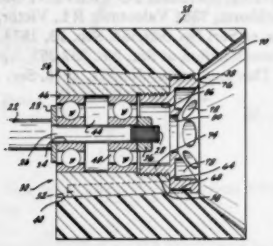
wedge having opposed faces formed with tapered sliding surfaces; (d) a mounting and positioning means formed and provided on the lower end of the housing apparatus from which end the rod end extends and moves; (e) a pair of feathers each having an enlarged upper end retaining means formed thereon, each feather having a finished inner face adapted to mate with and present a sliding surface to the wedge when passed therebetween with the increasing taper of the wedge urging the feathers apart; (f) a split clamp shell having means for removably securing said clamp shell to the mounting and retaining means of the lower housing, the clamp shell having a recess formed to retain the upper ends of the feathers against the mating surfaces of the wedge when the clamp shell is secured in position and is in a closed condition, and in an open position the wedge and feathers can be easily inspected for damage, wear and the like, the split clamp shell housing including complementary formed inner and outer surfaces in the mating members so that the split clamp shell housing when closed in place is a snug fit on the outer lower surface of the housing apparatus and the positioning means includes a groove formed in one of the mating members and a ring portion in the other member, the ring portion sized to mate with and seat in said groove, and (g) a clamp means for securing and maintaining the split clamp in a closed and secured position on the lower end of the housing apparatus, this clamp means being readily manipulable to close and open the split clamp.

4,114,952

WHEEL ASSEMBLY FOR A SKATEBOARD OR THE LIKE

Steven Donald Kimmell, Granada Hills, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 5, 1976, Ser. No. 739,073
Int. Cl.[2] A63C *17/22*
U.S. Cl. 301—5.7 **4 Claims**



1. In a wheel assembly for a skateboard or the like, the combination comprising:

a hub having a central aperture with a bearing receiving end and an internally threaded end, the outer surface of said hub being provided with a plurality of spaced longitudinally extending ribs and a flange adjacent said bearing receiving end;

a tire of a generally flexible material having a central aperture with a main portion and an enlarged recess, said main portion having grooves slidably engaging the ribs on the outer surface of said hub to prevent relative rotation therebetween; and

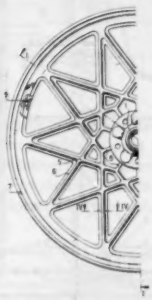
a hub cap having a threaded portion and a cap portion having generally the same diameter as said recess, said threaded portion engaging the threaded end of said hub, said recess being provided with radially inwardly extending integral detent means about the periphery thereof and said cap portion being provided with radially projecting ridge means of a length to engage and resiliently distort said detent means when rotating said threaded portion relative to said threaded end whereby to secure said tire to said hub and prevent loosening of said hub cap.

4,114,953

MOTOR VEHICLE WHEEL

Heinrich Baumgartner, Schenkenzell, Fed. Rep. of Germany, assignor to BBS-Kraftfahrzeugtechnik GmbH & Co. KG, Schiltach, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,100
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602710
Int. Cl.[2] B60B *1/10*
U.S. Cl. 301—63 DD **9 Claims**



1. A vehicle wheel having a rim bed, said wheel comprising two substantially identical, contiguous light metal pressings mounted on a hub member, each pressing forming a half of the rim bed, wherein:

(a) the hub member has cylindrical centering surfaces for the pressings,

(b) the two pressings are provided on their opposing inside surfaces with a layer of solderable material and are soldered both to the hub member and to one another at their contiguous surfaces,

(c) the two contiguous pressings form a spoke wheel center having spokes constituted of closed hollow sections and

(d) the spokes comprise substantially tangential main spokes and short radial auxiliary spokes, the main spokes extending inwardly from the rim bed in a direction approximately tangentially relative to the hub member and, at their innermost locations relative to the hub member, intersecting another main spoke, and the auxiliary spokes connecting radially the main spokes, at the innermost locations of the main spokes, to the hub member.

4,114,954

HYDRAULIC HOISTING

Arnold Roy Pasieka, Don Mills; John Corner Wilson, Falconbridge, and George Alexander Moruzi, Sudbury, all of Canada, assignors to Falconbridge Nickel Mines Limited', Toronto, Canada

Filed May 23, 1977, Ser. No. 799,593
Int. Cl.[2] B65G *53/30*
U.S. Cl. 302—14 **7 Claims**

1. A method for hydraulically hoisting mineral solids, in batch mode, from one level to a higher level of a mine, comprising:

i. providing a continuous fluid flow path between the levels and circulating water, continuously under pressure, therethrough;

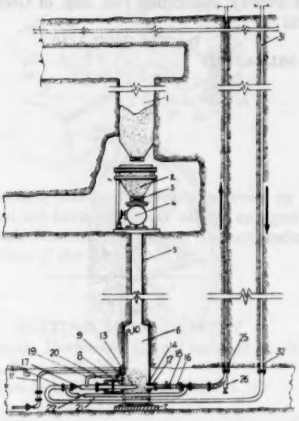
ii. providing a pressure vessel having fluid inlet and outlet means in opposed sidewalls thereof at the one level in the mine for selective communication with and isolation from the fluid flow path;

iii. periodically charging mineral solids to the pressure vessel and mixing with water therein, at atmospheric pressure, and isolated from the flow path;

iv. pressurizing the pressure vessel and selectively incorporating the vessel into the flow path to thereby discharge the mixture into the flow path;

v. conveying the mixture upwardly, under pressure, along a hoist conduit of the flow path, to the higher level;

vi. dewatering the mineral solids at the higher level and returning the water along a return conduit of the flow path to the one level for mixing with further mineral solids in the pressure vessel; wherein the return conduit is connected to the inlet means and is provided with nozzle means in the pressure vessel, slidable between a first position in which the pressure vessel is incorporated in the fluid flow path, and a second position in sealing engagement with the outlet means thereby isolating the pressure vessel from the continuous fluid flow path.



4,114,955

METHOD AND APPARATUS FOR TRANSFERRING MATERIAL WITH THE USE OF A FLUID

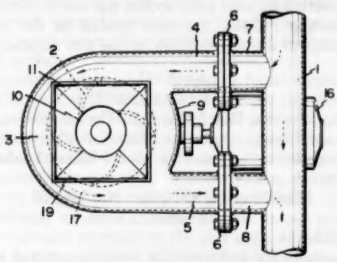
Toshinobu Araoka, Kitakyushu, Japan, assignor to Toyo Denki Kogyosho Co., Ltd., Fukuoka, Japan

Filed Jun. 7, 1977, Ser. No. 804,472

Claims priority, application Japan, Sep. 17, 1976, 51-112284

Int. Cl.² B65G *53/30*

U.S. Cl. 302—15 **14 Claims**



1. A method of continuously introducing a material containing solid matter into a continuously flowing pressurized stream of liquid disposed in a discharge pipe utilizing a motor driven impeller operable in a casing, comprising the steps of conducting said liquid along an inlet liquid path extending from a first location of said flowing pressurized stream to said casing, conducting said liquid along an outlet liquid path extending from said casing to a second location of said flowing pressurized stream, said second location being disposed downstream of said first location along a through section of said flowing pressurized stream, centrifugally increasing the pressure of said liquid in said casing by rotating said impeller about a vertical axis, causing the liquid to flow generally horizontally from said inlet liquid path to said outlet liquid path while effecting said pressure increase in said casing, charging said material to be transferred generally vertically through an opening in an upper side of said casing, mixing said vertically charged material with said liquid in said casing, conducting said liquid and material from said casing along said outlet liquid path at a pressure greater than the pressure of said flowing pressurized stream in said discharge pipe to discharge said liquid and material into said flowing pressurized stream at said second location, and continuously maintaining the pressure in said outlet path higher than the pressure of said flowing pressurized stream and higher than the pressure in said inlet liquid path such that the liquid passes through said casing from said inlet liquid path to said outlet liquid path without any fluid loss through said opening in said casing during said charging of said material into said casing.

4,114,956

TRANSPORTING IRON ORE SLURRIES

Harley Y. Jennings, Jr., Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 282,622, Aug. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 51,383, Jun. 30, 1970, abandoned. This application Feb. 5, 1976, Ser. No. 655,355

Int. Cl.² B65G *53/04*

U.S. Cl. 302—66 **8 Claims**

1. A method of pipelining iron ore comprising forming an aqueous slurry of iron ore particles of from 20 to 45 percent by volume, from 0.02 to 0.4 percent by weight based on iron ore content of the slurry of an ionic dispersant to contact the iron ore particles to impart negative charges thereon and from 0.01 to 0.2 percent by weight based on water content of the slurry of a nonionic organic polymer to increase the carrying capacity of the slurry for coarse iron ore particles, moving said slurry through a pipeline and recovering the iron ore particles from the slurry at a downline location.

4,114,957

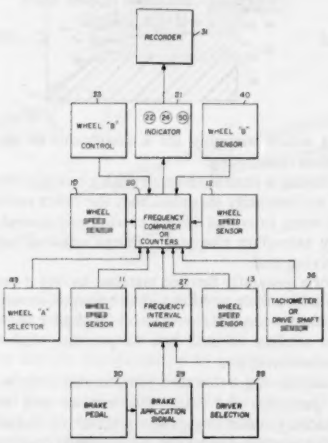
METHOD AND APPARATUS FOR CONTROLLING THE WHEEL BRAKES TO PREVENT SKID

Gustav E. Eichhorst, 7361 Valentown Rd., Victor, N.Y. 14564

Continuation of Ser. No. 508,553, Sep. 23, 1974, abandoned, which is a continuation of Ser. No. 352,267, Apr. 18, 1973, abandoned. This application Jun. 11, 1976, Ser. No. 695,101

Int. Cl.² B60T *8/10*

U.S. Cl. 303—96 **13 Claims**



13. A vehicle brake control system for first and second wheels of a vehicle equipped with brakes comprising:

means for detecting the prebraking and braking speeds of rotation of said first and second wheels;

means responsive to said detecting means for generating first and second pulse trains of energy respectively of varied

frequency in said prebraking and braking modes of operation;

comparer means for receiving said first and second pulse trains respectively and generating active and reference output pulse signals during prebraking and braking modes of operation;

voltage control circuit means for receiving said active and reference output pulse signals during prebraking and braking modes of operation and generating active and reference voltage signals respectively of a predetermined rotational speed ratio in the prebraking and braking modes of operation; and

brake means including valves for receiving said active and reference voltage signals in the braking mode of operation and in response thereto for continuously adjusting the brakes on said first and second wheels in an effort to maintain the braking rotational speed ratio of said first and second wheels substantially equal to the prebraking rotational speed ratio.

4,114,958

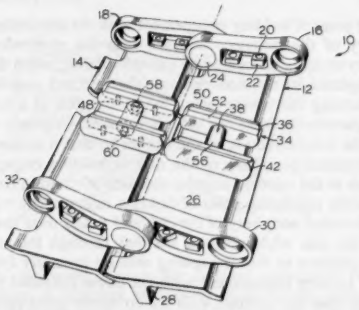
REPLACEABLE WEAR MEMBERS FOR AN ENDLESS TRACK

Roger L. Boggs, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 28, 1977, Ser. No. 781,821

Int. Cl.² G62D *55/20*

U.S. Cl. 305—56 **9 Claims**



1. A track shoe wear assembly for endless track-type vehicles comprising:

a track shoe;

hinge members mounted on the track shoe in spaced apart relationship;

at least one keyed rail support member releasably connected to the shoe between the hinge members and having a rail surface extending longitudinally thereon; and

a separate keyed lug drive member releasably connected to the keyed rail support member.

4,114,959

HYDROSTATIC SUPPORTING DEVICE INCLUDING BEARING SHOE

Alfred Christ, Zurich, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

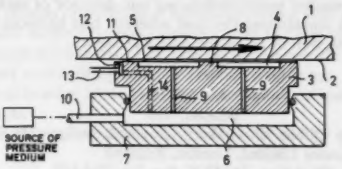
Filed Jul. 7, 1977, Ser. No. 813,550

Claims priority, application Switzerland, Jul. 14, 1976, 009005/76

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3.5 **5 Claims**

1. In hydrostatic supporting apparatus for supporting a mobile part which moves relatively to a foundation and which comprises a bearing shoe mounted in the foundation and having a supporting surface which faces a sliding surface of the mobile part and defines therewith a bearing gap, a hydraulic servomotor arranged to urge the shoe toward the mobile part, a bearing pocket formed in the supporting surface of the shoe and which is confined by a ledge, and means for delivering pressure medium to the servomotor and the bearing pocket, and wherein the shoe has front and rear ledge portions at its opposite sides in the direction of movement of the mobile part,



the improvement which comprises means defining a channel at the front ledge portion which opens towards the sliding surface; and means for delivering pressure medium to the channel, the channel serving to direct pressure medium into the region of the bearing gap located between the sliding surface and the front ledge portion.

4,114,960

RADIAL DISPLACEMENT DETECTOR DEVICE FOR A MAGNETIC BEARING

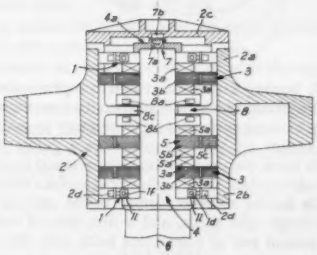
Helmut Habermann, Vernon; Maurice Brunet, and Jacques LeClére, both of Forét de Vernon, all of France, assignors to Societe Europeenne de Propulsion, France

Continuation of Ser. No. 582,880, Jun. 2, 1975, abandoned, which is a continuation of Ser. No. 433,791, Jan. 16, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,523

Claims priority, application France, Jan. 18, 1973, 73 01786

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **8 Claims**



1. A device for detecting radial displacement of a rotor relative to a stator and for creating a diametral restoring force for correcting the positioning of the rotor comprising a rotor; a stator; means for generating a control force on the rotor along a diametral plane of the stator; means controlling said force; and means for detecting the position of the rotor and for transmitting an error signal to said force controlling means; said detecting means comprising a plurality of pairs of detectors fixed to the stator and symmetrically arranged about said diametral plane, each pair consisting of two detectors placed diametrically opposite one another relative to the axis of rotation of the rotor; the detectors being connected together so that the two detectors of each pair of detectors have their signals algebraically subtracted one from the other and the two detectors of each couple of detectors consisting of two detectors symmetrically arranged about said diametral plane of the stator have their signals algebraically added; said pairs of detectors being arranged to constitute at least a first and a second detecting unit each including the same number of pairs

of detectors; the pairs of detectors constituting the first and second detecting units being symmetrically arranged about a first and a second diametral axis of symmetry respectively and said first and second diametral axes of symmetry being places symmetrically with respect to said diametral plane and being each angularly displaced therefrom by an angle of 30°, where the term diametral axis of symmetry of a detecting unit denotes that one of the two diametral axes of symmetry of this unit bisects the smaller sector embracing one detector of each pair of detectors constituting this unit whereby odd harmonics are eliminated as well as all of the even harmonics.

4,114,961

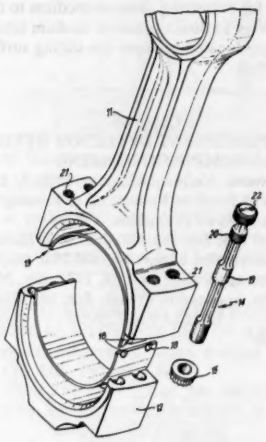
BEARINGS

Donald Roy Pithie, Shrewsbury, England, assignor to Rolls-Royce Motors Limited, London, England

Filed Nov. 23, 1976, Ser. No. 744,417

Int. Cl.[2] F16C *33/04;* B21D *53/10*

U.S. Cl. 308—237 R **10 Claims**



1. A shaft bearing comprising: two complementary parts providing an internal cylindrical surface, two arcuate bearing shells having exterior surfaces complementary to said internal cylindrical surface of said complementary parts, said two bearing shells being disposed within said parts and supported in contiguous relationship on the cylindrical surface thereof, said bearing shells having recesses formed in the external surface part way through said shells, and a first pair of connecting bolts and a second pair of connecting bolts, said first and second pairs of connecting bolts being disposed on diametrically opposite sides of said internal cylindrical surface of said parts for connecting said parts together, and said bolts extending through bolt holes in said parts and into said recesses on the external surface of said bearing shells to thereby locate said bearing shells axially of said parts and prevent rotation of the same relative said parts.

4,114,962

CONNECTING ELEMENT FOR INTRODUCING FORCES INTO A STRUCTURAL PART

Rudolf König, Ottobrunn, and Klaus Brunsch, Weidach, both of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Germany

Filed Oct. 8, 1976, Ser. No. 730,972

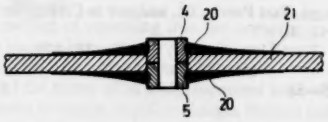
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545929

Int. Cl.[2] F16C *33/00;* B31C *13/00*

U.S. Cl. 308—238 **30 Claims**

15. A structural member comprising a structural part having an opening therethrough, a bush having a central axis, said bush being inserted for a portion of the axial length thereof into the opening in said structural part, said bush having a circumferential outer surface extending in the direction of its central axis, a multiplicity of roving sections impregnated with synthetic resin each contacting the circumferential outer surface of said bush and extending chordally outwardly from opposite sides of said bush and terminating at spaced points along an endless boundary line spaced outwardly from and extending around said bush, the oppositely extending sections of each said roving being angularly disposed relative to one another.

16. A connecting element formed by the method comprising inserting bushes into the opposite sides of a rotating disk having an arcuate circumferential periphery with the axis of the bushes being coaxial with the axis of rotation of the disk and with each of the bushes projecting outwardly from a different one of the opposite sides of the disk, removing a roving from a source of supply, passing the roving through a synthetic resin bath and guiding the roving into holding engagement with the circumferential periphery of the disk so that it remains in stationary contact with the circumferential periphery and passes over one side of the disk while rotating the disk for a selected angular distance so that the roving extends inwardly



from the point of holding engagement with the circumferential periphery of the disk into contact with the circumferential periphery of the bush located on one side of disk, when the disk has completed its rotation through the selected angular distance, moving the roving being fed to the disk at a location spaced outwardly from the circumferential periphery of the disk in the axial direction of the bushes so that it contacts the circumferential periphery of the disk in holding engagement therewith at the selected angular distance of rotation from the immediately preceding point of holding engagement with the circumferential periphery of the disk and passes over the other side of the disk while rotating the disk through the selected angular distance so that the roving extends inwardly from the point of holding engagement with the circumferential periphery of the disk into contact with the circumferential periphery of the bush located on the other side of the disk and repeating the steps until the desired winding of the roving on the disk has been completed, when the winding has been completed cutting the roving around the circumferential periphery of the disk to form two connecting elements each comprising one bush and the sections of the rovings located on the same side of the disk with the one bush, and removing the connecting elements from each side of the disk.

4,114,963

SUSPENDED FILES

Salomon Menahem, Hadera-Karkur, Israel, assignor to Superfile, Ltd., Hadera-Karkur, Israel

Filed Mar. 22, 1977, Ser. No. 780,182

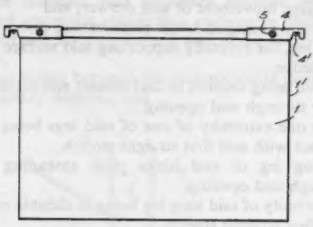
Claims priority, application Israel, Apr. 5, 1976, 49347; Dec. 14, 1976, 51101

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—184 **2 Claims**

1. A suspended file comprising: a file with longitudinal edges; reinforcing channels for the longitudinal edges of said file; suspension elements having separate parts from said reinforcing elements and being longitudinally movable relative to said reinforcing channels; said suspension elements comprising short channels mounted on top of said reinforcing channels; said reinforcing channels having through-going longitudinally extending elongated slots; said files having a registering slot for alignment with said elongated slots; said suspension elements

having means extending into said slot to limit sliding movement. , said suspension elements having hook-shaped ends with a cutout on the underside thereof, said suspension element comprising channel means riding on top of said reinforcing



channels and having a rivet extending through said slot, the movement of said rivet and said suspension elements being limited by said slot, said suspension elements projecting from transverse edges of said file.

4,114,964

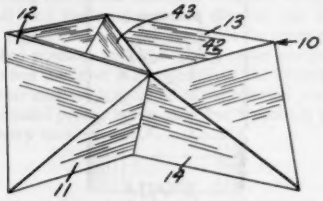
MODULE FOR FORMING ARTICLES OF FURNITURE

Charles S. Coster, Main St., Stockbridge, Mass. 01262

Filed May 18, 1977, Ser. No. 798,000

Int. Cl.² A47B *53/00*

U.S. Cl. 312—198 **1 Claim**



1. An improved module for forming articles of furniture comprising: a plurality of hollow quadrilateral pyramidally shaped elements, each element having a square base wall and three equilateral triangular side walls converging to an apex from three sides of said base to define a triangularly-shaped opening affording access to the interior of said element from a fourth side of said base wall; said elements each being foldably interconnected along an edge of said base wall thereof to permit relative pivotal movement wherein a base wall or a triangular wall of each of said elements may be selectively placed in abutted relation relative to a corresponding wall of an adjacent interconnected element to form a desired configuration in which at least one of said triangularly shaped openings is exposed whereby articles may be stored, when one surface of said configuration is supported upon a horizontally disposed floor.

4,114,965

MEDICATION DISPENSING CART

Lloyd J. Oye, Rancho Palos Verdes, and Barry Ogden, Rolling Hills Estates, both of Calif., assignors to Trans-Aid Corporation, Carson, Calif.

Filed Nov. 4, 1976, Ser. No. 738,802

Int. Cl.² A47B *81/00*

U.S. Cl. 312—209 **4 Claims**

1. A portable medicine dispensing cart comprising:

a cabinet having a hollow interior enclosed by four sides, a bottom and a flat top working surface;

hinged door means on one side providing access to said hollow interior;

a plurality of medication storage bins slidably supported in removable wire rack cassettes in said hollow interior accessible behind said hinged door means;

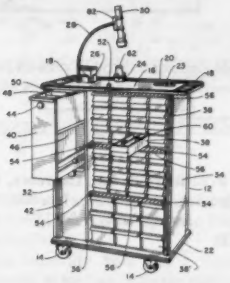
a pair of lockable, slidably extendable, vertically oriented drawers, one above the other, adjacent to said plurality of medicated storage bins;

said vertical drawers being divided into a plurality of compartments with a compartment accessible from the top and a bottom compartment accessible from a side adjacent to said medication bins, whereby said vertical drawers and medication storage bins may be simultaneously accessible;

a cart wall locking security system comprising;

a wall bracket having a pair of horizontally aligned keyhole slots,

a pair of socket balls secured to the rear wall of said cabinet



adapted to engage said horizontal keyhole slots of said bracket,

a hole in said wall bracket,

a spring-loaded pin extending out of the rear wall of said cabinet and adapted to engage the hole in said wall bracket when said socket balls are fully engaged in said keyhole slots,

holding means for holding said pin in an extended position when said cart is secured,

an adjustable size cup dispenser accessible through a circular aperture in said top surface comprising:

retaining means circumjacent said circular aperture in said top surface for retaining said cups; and

resilient means for adjusting said retaining means for different size cups.

4,114,966

BATHROOM CABINET

Walter Schneider, 54 Wildenbühlstrasse, Langnau am Albis, Switzerland

Filed Jan. 24, 1977, Ser. No. 761,820

Claims priority, application Switzerland, Jan. 31, 1976, 1207/76

Int. Cl.² A47B *67/02*; F16B *12/00*

U.S. Cl. 312—245 **12 Claims**

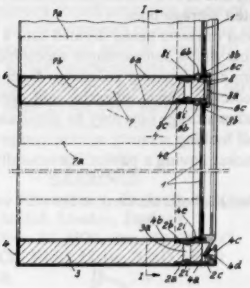
1. A container for use as a cabinet, in particular as a bathroom cabinet, comprising:

(a) a framework;

(b) a back wall in the form of at least one plate supported by the framework; and

(c) side walls supported by the framework, wherein the framework is formed by a plurality of U-section bars, each having sides projecting at right angles to the back wall, and a plurality of corner angle pieces formed of hard foamed plastic slipped in between said sides of said U-section bars and positively connected thereto, said corner angle pieces having bores extending beyond said U-section bars and said side walls being in the form of U-section

covering panels fitted over said corner angle pieces, the positive connection between the corner angle pieces and



the sides being effected through creases in the area of said bores recessed in the corner angle pieces.

4,114,967

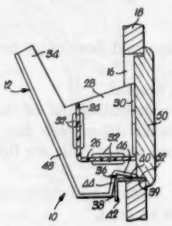
DRAWER

Jon L. Weekly, 2722 Rawhide La., Lawrence, Kans. 66044

Filed Sep. 2, 1977, Ser. No. 830,061

Int. Cl.[2] A47B *88/18*

U.S. Cl. 312—328 **4 Claims**



1. For attachment to a cabinet and a panel member ordinarily covering an opening in the wall of said cabinet wherein one edge of said wall defining said opening presents a ledge for supporting a drawer thereon, said panel being of a type having a rabbeted margin overlying said wall portions and extending partially into said opening, a drawer assembly comprising:

structure adapted to be attached to one side of said panel member whereby the latter provides a front wall for said structure,

said structure including a rear wall, sidewalls, and a bottom wall connected together and forming, in combination with said panel member, an article receptacle area normally disposed within said cabinet when said drawer is in a closed position,

said structure further including surface portions adjacent said bottom wall, for frictionally engaging said cabinet ledge and cooperating with said panel member to provide a hinge means for retaining and pivotally supporting said drawer on said cabinet within said opening of the latter for swinging movement of said drawer between said closed position and an open position,

said structure also being provided with a surface area adapted to engage said cabinet wall during swinging movement of said drawer, for limiting the travel of said structure away from said cabinet,

said hinge means being generally disposed below said article receptacle area and said surface portions including a first straight stretch having the longitudinal axis thereof inclined with respect to the plane of said cabinet wall and frictionally engaging an inner edge of said ledge upon swinging movement of said drawer,

a surface portion of said panel margin being disposed in spaced, opposed relationship to said first straight stretch and frictionally engaging an outer edge of said ledge upon swinging movement of said drawer; and

a generally L-shaped hinge plate having a short leg and a long leg, for pivotally supporting said surface portions of said ledge,

said plate being secured to said cabinet and extending essentially through said opening,

at least one extremity of one of said legs being in slidable contact with said first straight stretch,

said long leg of said hinge plate extending essentially through said opening,

one extremity of said long leg being in slidable contact with said first straight stretch,

the opposite extremity of said long leg being in slidable contact with said rabbeted margin of said panel member.

4,114,968

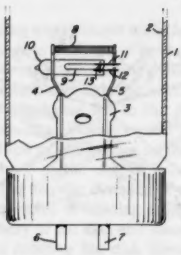
METHOD OF PROCESSING FLUORESCENT LAMP

Frank M. Latassa, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 5, 1976, Ser. No. 673,823

Int. Cl.[2] H01J *9/12*

U.S. Cl. 316—1 **5 Claims**



1. In the manufacture of a rapid start fluorescent lamp comprising a sealed envelope with an electrode at each end thereof and having a heater current disconnect switch within the envelope proximate to, and in series with, a lamp electrode, the switch being normally closed at room temperature but open at or above a predetermined elevated temperature and wherein the electrode contains a cathode coating that must be heated to a predetermined elevated temperature in order to activate said coating, the process which comprises providing a shorting fuse within the envelope and in parallel with said switch, heating said electrode to the predetermined temperature which activates said coating and which opens said switch as a result of direct heat transfer from the electrode to the switch, and then melting the fuse, while the switch is open, by applying thereto a pulse of electrical current.

4,114,969

PLUG RELEASE MECHANISM

John P. Borg, 10 Poplar Heights Dr., Islington, Ontario, Canada

Filed Sep. 29, 1977, Ser. No. 837,924

Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—45 R **5 Claims**

1. A plug release mechanism comprising:

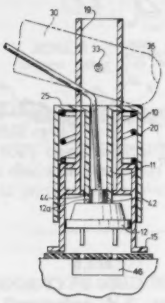
(i) a reciprocatable member having an open end and an end wall closing the opposite end, said member being movable between a locked position and a released position;

(ii) a tubular member in the reciprocatable member and coaxial therewith, the inside end of the tubular member being adapted to have mounted thereon an electric plug having terminal prongs thereon and said inner member

being mounted for movement with the reciprocatable member between said locked and released positions;

(iii) a stationary member mounted within the reciprocatable member and coaxial therewith, said stationary member being positioned between the inner member and the reciprocatable member, said stationary member having an elongated extension projecting outwardly through an orifice formed through the end wall of the reciprocatable member;

(iv) a spring acting between the reciprocatable member and the stationary member; and



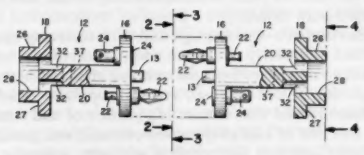
(v) a lever pivotally mounted on the extension, the fulcrum of the lever being located between the end wall and the projecting end of the extension whereby, with the lever coaxial with the reciprocatable member, one end of the lever engages the end wall and holds the inner member in a locked position with the spring under compression so that when the lever is released from the locked position, the inner member is actuated to the released position with the terminal prongs being moved to a position within the stationary member.

4,114,970

ELECTRICAL MARINE CONNECTOR

Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 8, 1977, Ser. No. 831,590
Int. Cl.[2] H01R *13/52, 25/02*
U.S. Cl. 339—49 R **4 Claims**



1. An electrical cable connector, comprising:

a. a pair of connector units each attachable to a cable-end for electrically interconnecting the same;

b. each connector unit formed of rigid insulating material defined by longitudinally-spaced front and rear circular end walls connected by an axial transverse partition wall;

c. male and female electrical contact elements mounted on the front end wall of each connector unit on opposite sides of said partition wall and being aligned for telescopic connection with one another in response to axial endwise movement of said units toward each other;

d. an axial opening in said rear end wall to receive a cable-end and communicating with a pair of spaced-apart openings leading to opposite sides of said partition wall;

e. passages extending transversely through said partition wall in spaced relation to said spaced apart openings for separately receiving the lead ends of electrical conductors projecting from said cable-end extending through said spaced-apart openings and said passages to said opposite sides of said partition wall; and

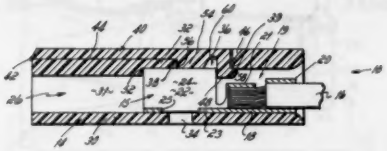
f. means electrically connecting said lead ends to the related contact elements including solder balls each greater in transverse dimension than its related passage for anchoring said lead ends to said partition wall.

4,114,971

CLUSTER ASSEMBLY AND BLOCK THEREFOR

Henry H. Heimbrock, Cincinnati, Ohio, assignor to Van Products, a Division of Standex International Corporation, Andover, Mass.

Filed Sep. 30, 1976, Ser. No. 728,386
Int. Cl.[2] H01R *13/42*
U.S. Cl. 339—59 R **20 Claims**



1. A block for a cluster assembly, comprising,

an insulative housing having at least one longitudinal clip-receiving passageway,

a transverse pin-receiving hole and a transverse detent-receiving opening extending from the outer surface of said housing to said passageway, and

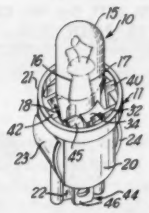
a cap having an integral detent depending from a surface thereof and adapted to project through said detent-receiving opening to prevent rearward longitudinal removal of a clip from said passageway, said detent including a locking lip adapted to project into said passageway to lock said cap to said housing, a surface of said detent-receiving opening being rearward of said detent and forming means to limit rearward flexing of said detent after said detent is received in said opening.

4,114,972

WEDGE BASE BULB SOCKET

Willibald Kraus, and Bodo Arthur Greulich, both of Kaiserslautern, Fed. Rep. of Germany, assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,221
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628127
Int. Cl.[2] H01R *33/06*
U.S. Cl. 339—65 **6 Claims**



1. A socket for a wedge base capless bulb having contact wires comprising a body of insulating material, a cavity in the socket body to receive the base of the bulb, the cavity being defined by end walls and side walls and the side walls having resilient side wall portions adapted to grip the base of the bulb, resilient contact elements adapted to grip opposite sides of the base of the bulb in contact with the contact wires of the bulb, each end wall of the cavity having an inclined guide surface,

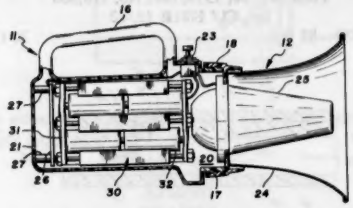
each of which guide surfaces faces a side wall and is inclined from the mouth of the cavity outwardly and towards the facing side wall, the guide surfaces being adapted to guide the contact wires of the bulb into substantially parallel contacting relationship with the contact elements as the base of the bulb is inserted into the cavity.

4,114,973

POWER SUPPLY FOR TRANSPORTABLE DEVICES

Paul Franklin Stiller, 23675 Smithtown Rd., Shorewood, Minn.

Filed Mar. 3, 1977, Ser. No. 774,197
Int. Cl.[2] H01M *2/10;* H01R *13/54*
U.S. Cl. 339—92 M **2 Claims**



1. A packaging and containing structure for combining a plurality of power sources to provide a power supply, said structure including:

a. a first, deformable plate member having a power source contact on one side thereof;

b. a second, deformable plate member having a power source contact on one side thereof;

c. a plurality of longitudinally adjustable connecting means being arcuately positioned on each of said plates and extending therebetween for connection thereof and providing a defined ring of said spaced connecting means for retaining a plurality of power sources in side by side relation therein;

d. means for longitudinally adjusting the connective length of said adjustable connecting means to electrically clamp a power source between sid plates;

e. one of said longitudinally adjustable connecting means being electrically conductive and being connected to said power source contacts; and,

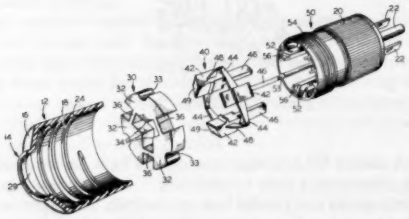
f. electrical conductive means provided respectively on each of said plates whereby said energy providing structure may be utilized in an electrical circuit.

4,114,974

DUST SHIELD FOR CAP AND CONNECTOR

George J. Lawrence, North Kingston, R.I., assignor to General Electric Company, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,580
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 C **7 Claims**



1. A closure for a cable entrance to a connector comprising,

an annual ring of resilient material,

said ring being made up of a plurality of wedge-shaped sectors,

said sectors being interconnected by a plurality of webs formed integrally with said wedge-shaped sectors,

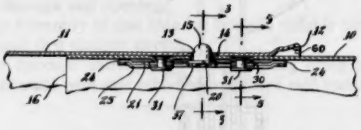
the inner extent of the sectors being oriented generally toward the center of the annual ring.

4,114,975

DISPLATION TYPE ELECTRICAL CONNECTOR

Charles Harry Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 20, 1977, Ser. No. 817,406
Int. Cl.[2] H01R *13/50*
U.S. Cl. 339—176 M **9 Claims**



1. A pre-loaded electrical connector comprising:

an insulating housing having a wire-receiving face and having a contact receiving cavity extending into said wire-receiving face,

a sheet metal contact terminal in said cavity, said terminal having a wire connecting portion which is proximate to said wire-receiving face, said wire connecting portion comprising an elongated metal strip having a reversely formed portion in said cavity and having a wire-receiving opening therein which is adjacent to said wire-receiving face, said strip having a free end which is generally opposite to said wire-receiving opening, said free end being spaced from an intermediate portion of said terminal, a wire-receiving slot extending inwardly from said free end through portions of said strip,

said wire connecting portion being deformable inwardly of said cavity with concomitant movement of said free end past an inserted wire and transversely of the axis of an inserted wire whereby,

upon insertion of a wire through said wire-receiving opening and into said cavity so that an end portion of said wire is between said free end of said terminal and said intermediate portion of said terminal, and upon applying a deforming force to said wire connecting portion of said terminal, said free end of said strip moves past said end portion of said wire and said slot receives said wire whereby edge portions of said slot establish electrical contact with said wire.

4,114,976

ELECTRICAL CONNECTOR ASSEMBLY

Gerald Joseph Selvin, Birmingham, Mich.; Leland Wayne Oliver, Santa Ana, Calif.; Stephen Kazuo Yamamoto, Los Angeles, Calif., and Clarence Vaughn Hogan, Sun Valley, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

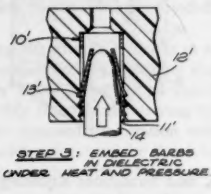
Continuation-in-part of Ser. No. 679,342, Apr. 22, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,315
Int. Cl.[2] H01R *13/42*
U.S. Cl. 339—217 S **9 Claims**

1. An electrical connector assembly, said assembly comprising:

an insulator body having a cavity therein;

a longitudinally slit, hollow, resilient contact retention clip in said cavity, said clip having a forwardly and inwardly extending spring tine and a plurality of discontinuities therearound spaced from said tine;

said clip being expanded from an initial configuration while



in said cavity to snugly fit the outer surface thereof against the wall of said cavity; and

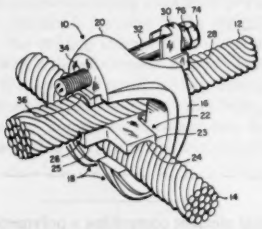
said insulator body being thermally deformed at the locations of said discontinuities so as to seize upon said clip thereat and to prevent axial movement of said clip in said cavity.

4,114,977

SINGLE WEDGE-TYPE GRID WIRE CONNECTOR

Mario Polidori, Pennsauken, N.J., assignor to UTM Power Products, Inc., Westmont, Ill.

Filed May 9, 1977, Ser. No. 795,178
Int. Cl.[2] H01R 7/06
U.S. Cl. 339—270 R **12 Claims**



1. A connector for joining two conductors extending transversely one another, comprising:

(a) a body member including a pair of fingers openly spaced apart at one end for straddling a first conductor extending in a given direction between said fingers and having seating surfaces at said one end suitably shaped for grasping a second conductor at spaced locations therealong extending transversely of said first conductor, and a yoke section joining said fingers at the other end thereof;

(b) a nesting member formed with at least two opposing seating surfaces extending transversely of one another and adapted to be positioned between said conductors so that a lower one of said seating surfaces cooperates with said fingers to grip said second conductor therebetween and the upper one of said seating surfaces forms a seat for said first conductor;

(c) an elongated wedge member adapted to be positioned beneath said yoke section between said fingers, and over a portion of the length of said first conductor, and provided with a suitably shaped undersurface which cooperates with the upper seating of said nesting member to grip said first conductor therebetween; and

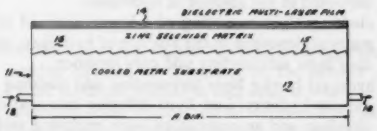
(d) means for coupling said wedge member to said yoke section for relative movement therebetween, such that when said first conductor is positioned between the upper seating surface of said nesting member and the undersurface of said wedge member, and said second conductor is positioned between the fingers of said body member and the lower seating surface of said nesting member, said wedge member can be driven in the space between said yoke section and said first conductor so as to secure both said conductors in nested relation.

4,114,978

BURIED GRATING SHARED APERTURE DEVICE

Hoyt A. Bostick, Irvine; Paul M. Sutton, Newport Beach, and Chester L. Richards, Irvine, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 1, 1977, Ser. No. 812,304
Int. Cl.[2] G02B 5/18
U.S. Cl. 350—1.7 **3 Claims**



1. A buried grating shared aperture device for separating a high energy laser beam and a low frequency infrared beam both sharing a common aperture, comprising:

a. a cooled metal substrate having a flat surface;

b. a blazed diffraction grating fabricated in the said flat surface of the substrate;

c. A thin imbedding matrix positioned in contacting relationship over the said grating and providing an optically flat surface; and

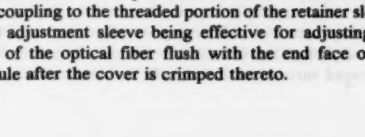
d. a multi-layer, dielectric, dichroic coating positioned on the said flat surface.

4,114,979

FIBER OPTIC CONNECTOR

Earl R. Heldt, Monta Vista, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 731,068, Oct. 8, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 792,375
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **7 Claims**



1. A fiber optic connector for end-to-end connection of individual optical fiber cables having an optical fiber, a fiber jacket and a cover, said connector comprising:

a ferrule, including two half shells and a retainer sleeve having a portion of its outside diameter threaded, for retaining the optical fiber and fiber jacket;

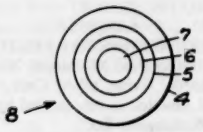
a sleeve for retaining the cover; and

an adjustment sleeve having male threads for coupling to the inside surface of the optical fiber cover and female threads for coupling to the threaded portion of the retainer sleeve, said adjustment sleeve being effective for adjusting the end of the optical fiber flush with the end face of the ferrule after the cover is crimped thereto.

4,114,980
LOW LOSS MULTILAYER OPTICAL FIBER

Adolf R. Asam, Daleville, and Mokhtar S. Maklad, Roanoke, both of Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 10, 1976, Ser. No. 685,198
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.33 8 Claims



1. A low loss high numerical aperture optical communications fiber comprising:

a core member consisting of a high refractive index material deposited in the absence of hydrogen;

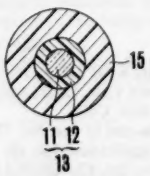
a cladding layer consisting of a lower index of refraction material deposited in the absence of hydrogen, said cladding layer surrounding said core member;

a hydroxyl barrier layer surrounding said cladding layer to prevent hydroxyl ions from diffusing into said core and cladding; and an outer silica layer enclosing said barrier layer for providing structural support to the fiber.

4,114,981
OPTICAL FIBER FOR COMMUNICATION

Yukinori Ishida, Mito; Moriaki Kojima, Yachiyo; Toshiaki Kobayashi, Chiba, and Yasuyuki Sugawara, Sakura, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and The Fujikura Cable Works, Ltd., both of, Japan

Filed May 16, 1977, Ser. No. 797,389
Claims priority, application Japan, May 26, 1976, 51-61017
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.33 4 Claims



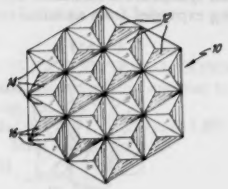
1. An optical fiber for communication comprising an optical fiber covered with a coating of a high-molecular elastomer having a flexural modulus of not less than 200 kg/cm^2 at room temperature, the difference between the flexural moduli of said elastomer at room temperature and about −50° C. being not more than 1000 kg/cm^2.

4,114,982
SCREENS SUITABLE FOR USE IN PHOTO-ENGRAVING AND PHOTO-LITHOGRAPHIC PROCESSES AND IN COLOR TELEVISION

Raymond Buckley, 13 Church St., Wood Ln., Bignall, Stoke-on-Trent, Staffordshire, England

Filed Apr. 15, 1976, Ser. No. 677,154
Int. Cl.[2] G03B 21/60
U.S. Cl. 350—127 13 Claims

1. A stationary light-transmitting screen comprising a piece of transparent material having one face and a plurality of pointed formations formed on said one face and defining a contoured surface, such that light incident on said contoured surface is refracted as it passes through the screen and any image being transmitted is broken up into a pattern of dots by

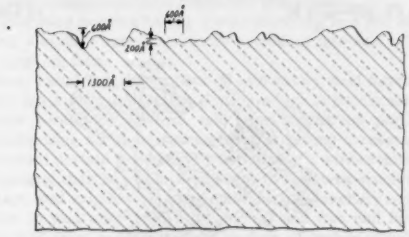


said formations, said formations adjoining one another such that said one face is free of interstices.

4,114,983
POLYMERIC OPTICAL ELEMENT HAVING ANTIREFLECTING SURFACE

Kent N. Maffitt, Minneapolis; Hubert U. Brueckner, White Bear Lake, and Dean R. Lowrey, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1977, Ser. No. 770,044
Int. Cl.[2] G02B 1/10
U.S. Cl. 350—164 4 Claims



1. An optical element comprising a polymeric material having a surface containing a plurality of randomly positioned peaks, a predominant number of which range in amplitude approximately between 20 and 160 nm, the separation of adjacent peaks being not greater than three times the maximum amplitude of said peaks, wherein the total reflectance of visible light incident normal to said surface is less than two percent and the intensity of visible light transmitted in one direction is at least 10^3 greater than the intensity of transmitted visible light measured 5° off said one direction.

4,114,984
ZOOM LENS BARREL CAPABLE OF MACRO-PHOTOGRAPHY

Takeshi Muryoi, Chigasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,307
Claims priority, application Japan, Nov. 7, 1975, 50-150721[U]
Int. Cl.[2] G02B 15/00
U.S. Cl. 350—187 4 Claims

1. A zoom lens barrel having a focusing lens system and a magnification lens system including first and second movable lens groups, in which zooming is effected by moving both the first and second lens groups and focusing for macro-photography is effected by moving the first movable lens group with the second movable lens group fixed at the position for the macro-photography, the zoom lens barrel comprising:

a fixed tube provided with a first cam groove;

an operation ring mounted for rotation and sliding movement relatively to the fixed tube;

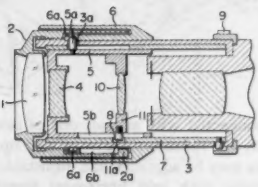
means for moving the focusing lens system in association with the rotation of the operating ring;

a driving cylinder holding the first movable lens group and provided rotatably and slidably with respect to the fixed tube, the driving cylinder being provided with a second cam groove;

means for moving the driving cylinder in association with the sliding movement of the operating ring;

a driven cylinder holding the second movable lens group and being slidably fitted on the driving cylinder;

a switch cylinder disposed for rotation within a predetermined angle with respect to the fixed tube, the switch cylinder being provided with a third cam groove;



a first connecting member for connecting the driving cylinder to the first cam groove;

a second connecting member for connecting the driven cylinder to the second cam groove and the third cam groove; and

the third cam groove including a zooming portion in which the driven cylinder is movable in the optical axial direction when the driving cylinder is rotated and a macro portion in which the movement of the driving cylinder is prevented the zooming portion being continuous to the macro portion, and the switch cylinder being operable so that the second connecting member may be located in either the zooming portion or the macro portion.

4,114,985

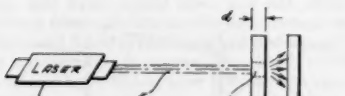
SHIELD FOR HIGH POWER INFRARED LASER BEAM

Jerome D. Friedman, 15 Lake St., Lexington, Mass. 02173

Filed Mar. 28, 1974, Ser. No. 457,674

Int. Cl.[2] G05D *25/00*; G21F *5/04*

U.S. Cl. 350—266 **3 Claims**



1. A shield for terminating the beam of a high power infrared laser source comprising

first and second spaced, juxtaposed, opaque, clay base, ceramic sheet members, said first sheet member intercepting said beam and having a sheet thickness to beam power density relationship that allows opaque to translucent conversion of said first sheet member by said beam and said second sheet member being spaced from said first sheet member a distance that permits Raleigh scattering and effective heat transfer of laser energy transmitted through said first sheet member.

4,114,986

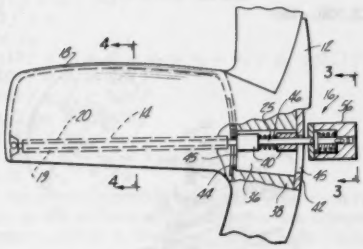
REVERSIBLE SIDE MOUNT MIRROR

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Aug. 16, 1977, Ser. No. 825,097

Int. Cl.[2] G02B *17/00*

U.S. Cl. 350—282 **12 Claims**



1. A reversible rearview mirror for vehicles comprising; a support member adapted for mounting on the exterior of a vehicle, a shaft mounted relative to said vehicle with one end disposed exteriorly of the vehicle and the other end within the passenger compartment of the vehicle, means supporting said shaft for rotation about its longitudinal axis and for pivotal movement about a vertical axis, a mirror member having oppositely facing mirror surfaces for day and night use on opposed surfaces thereof, said mirror member being mounted on said shaft for rotation of a selected one of said mirror surfaces to a viewing position and rotation 180° to present the other of said surfaces in said viewing position, said mirror member being mounted for pivotal movement therewith for adjustment to an angular position relative to said vehicle.

4,114,987

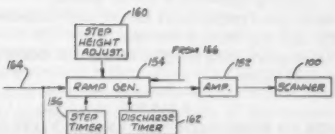
DEFLECTOR CONTROL CIRCUIT

Robert J. Vagi, 8532 Avery St., Broadview Heights, Ohio 44147

Filed Mar. 5, 1976, Ser. No. 664,167

Int. Cl.[2] G05D *25/00*

U.S. Cl. 350—285 **26 Claims**



1. A control circuit for an optical deflector having a movable beam-directing element and an input circuit for moving the beam-deflecting element as a function of an electrical potential applied to the input circuit, the control circuit comprising:

(a) a generator for impressing a voltage waveform on the input circuit having a portion inducing sweep motion and a portion inducing retrace motion of the beam directing element; and,

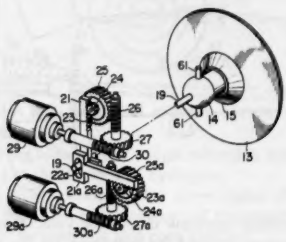
(b) circuitry for causing an abrupt variation in the retrace waveform portion to compensate for harmonic vibrations in the retrace motion caused by a transition between the sweep and retrace motion.

4,114,988

MIRROR ANGLE ADJUSTING DEVICE, WITH CONSECUTIVELY DRIVEN WORMS IN REMOTELY CONTROLLED REAR-VIEW MIRROR APPARATUS

Masao Enomoto, Isehara, Japan, assignor to Ichikoh Industries, Limited, Tokyo, Japan

Filed Sep. 20, 1977, Ser. No. 835,284
Claims priority, application Japan, Oct. 21, 1976, 51-25519
Int. Cl.[2] G02B 7/18
U.S. Cl. 350—289 7 Claims



1. A mirror angle adjusting device in a remotely controlled rear view mirror apparatus for automobile, comprising:
a frame;
a mirror attachment plate;
a ball to which said mirror attachment plate is secured;
a ball-and-socket joint for rotatably holding said ball on said frame;
a shaft extending from the ball at a site different from the site at which the mirror attachment plate is secured to the ball;
slidable members crossing each other and movably held on said frame;
slots provided in said slidable members to cross each other at right angle and having said shaft of the ball passing through the point of cross of these slots; and
driving mechanisms provided on said frame for moving said respective slidable members independently of each other;
said driving mechanisms comprising:
electric motors;
racks provided on said slidable members;
pinion gears engaging said racks;
first worm wheels rotatable with said pinion gears;
first worms engaging these first worm wheels;
second worm wheels rotatable with said first worms; and
second worms secured to the shafts of said electric motors and engaging said second worm wheels,
said worm gears respectively having teeth constituting automatic one-way motion function,
said pinion gears being coupled to said first worm wheels via slip mechanisms.

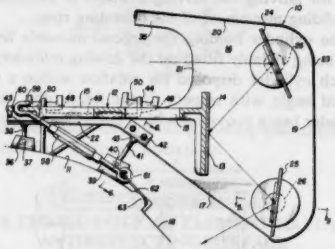
4,114,989

OVERHEAD ROOF-MOUNTED REAR VIEW MIRROR

Charles G. Badgley, St. Petersburg, Fla., assignor to Richard B. Badgley, St. Petersburg, Fla.

Filed Jun. 6, 1977, Ser. No. 803,851
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—302 9 Claims

1. An overhead rear view mirror for mounting on the roof of an automotive vehicle in a fixed relationship to the windshield of such vehicle and in alignment with the eyes of the vehicle driver, said overhead rear view mirror comprising a substantially horizontal frame section having plural adjustable mounting feet depending therefrom and being engageable with an automobile roof, said horizontal frame section including a substantially vertical web at its forward end near and above the windshield of a vehicle on which the device is mounted, a stationary substantially vertical mirror section on said vertical web, a pair of substantially vertical side panels fixedly attached to opposite sides of the horizontal frame section and extending above, below and forwardly of said vertical web and stationary mirror section, a shroud spanning the space between said vertical side panels and connected thereto and forming with the side panels a mirror enclosure, an upper and a lower mirror section in said enclosure forwardly of the stationary mirror section and above and below the latter, respectively, means mounting said upper and lower mirror sections rotatably on horizontal transverse axes in said enclosure including rotary



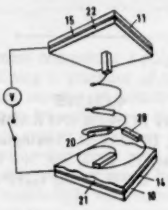
shaft means connected with at least one of said vertical side panels whereby the reflective angles of said upper and lower mirror sections may be adjusted, and adjustable cable harness means connected with said horizontal frame section and adapted to releasably engage a structural part of a vehicle on which the device is mounted for securing the device to the vehicle.

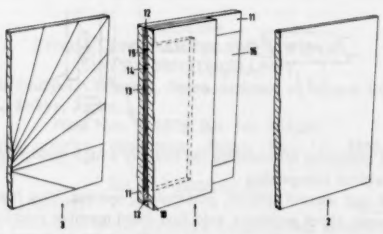
4,114,990

LIQUID CRYSTAL ROTATOR

Derek H. Mash; William A. Crossland, both of Harlow, and Joseph H. Morrissy, Dunmow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,684
Claims priority, application United Kingdom, May 4, 1976, 18155/76
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—337 8 Claims





1. A liquid crystal cell including a layer of cholesteric material having a pitch longer than the quotient of the wavelength of light divided by the birefringence, but not longer than four times the layer thickness, which layer is sandwiched between two transparent electroded plates one having surface treatment

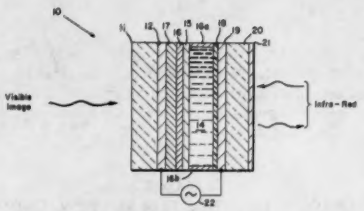
providing, in the absence of the electric field across the layer, homeotropic alignment of the liquid crystal molecules adjacent said one plate, while other plate has a surface treatment providing, in the absence of an electric field across the layer, homogeneous parallel alignment of the liquid crystal molecules adjacent said other plate.

4,114,991

VISIBLE-TO-INFRARED CONVERTER LIGHT VALVE

William P. Bleha, Jr., Carlsbad, and Jan Grinberg, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 22, 1976, Ser. No. 753,253
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—338 8 Claims



1. Liquid crystal light valve means for converting a visible wavelength dynamic image to an infrared wavelength dynamic image, said light valve means comprising:

(a) a first faceplate of visible wavelength transmissive material having one side thereof positioned to receive a visible wavelength image;

(b) a dichroic conductive electrode film on the other side of said faceplate, said film being transmissive in the visible wavelength region but reflective in the infrared wavelength region;

(c) a second faceplate of infrared wavelength transmissive material positioned in spaced opposed relationship to said first faceplate;

(d) a layer of liquid crystal material and means for confining said layer between said first and second faceplates;

(e) means to apply a voltage across said liquid crystal layer;

(f) variable impedance photosensor means for modulating said voltage spatially and temporally responsively to incidence thereon of said visible wavelength image, said photosensor means being positioned to receive said visible wavelength image transmitted through said film; and

(g) said photosensor means being transparent to infrared radiation and said liquid crystal being responsive to variation of the voltage applied across it to vary the polarization of infrared radiation transmitted through it whereby infrared radiation transmitted through said second faceplate, said liquid crystal layer, and said photosensor is reflected from said dichroic film back through said photosensor, said liquid crystal layer and said second faceplate and is polarization modulated responsively to the voltage across said liquid crystal layer in both of its transits therethrough.

4,114,992

VARIANT ERNOSTAR TYPE LONG FOCUS LENS SYSTEM

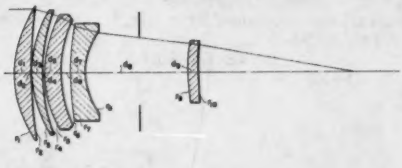
Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,635
Claims priority, application Japan, Dec. 29, 1975, 51-157983
Int. Cl.[2] G02B 11/30
U.S. Cl. 350—216 4 Claims

1. A variant Ernostar type long focus lens system comprising a first positive meniscus lens component, a second positive meniscus lens component, a third positive meniscus lens component, a fourth negative meniscus lens component and a fifth lens component, and said lens system satisfying the following conditions:

(1) $1.3\,f < r_2$
(2) $0.3\,f < r_3 < 0.36\,f$
(3) $0.45\,f < r_4 < 0.58\,f$
(4) $0.3\,f < r_5 < 0.36\,f$
(5) $0.38\,f < r_6 < 0.46\,f$
(6) $0.8\,f < r_7 < f$
(7) $0.18\,f < r_8 < 0.2\,f$
(8) $0.5\,f < r_9$
(9) $f < r_{10}$
(10) $0.15\,f < d_1 + d_2 + d_3 + d_4 + d_5 + d_6 < 0.17\,f$
(11) $0.05\,f < d_5 < 0.07\,f$
(12) $0.01\,f < d_6 < 0.03\,f$
(13) $0.03\,f < d_7 < 0.05\,f$
(14) $0.28\,f < d_8$
(15) $1.62 < (n_1 + n_2 + n_3)/3$
(16) $1.76 < n_4$

wherein the reference symbols r_1 through r_{10} represent radii of curvature on the surfaces of the respective lens components, the reference symbols d_1 through d_9 designate the thicknesses of the respective lens components and airspaces therebetween, the reference symbols n_1 through n_5 denote the refractive indi-



ces of the respective lens components and reference symbol f represents the focal length of the lens system as a whole, said system

having the following numerical data:

$r_1 = 35.690$; $d_1 = 4.539$; $n_1 = 1.66672$; $\nu_1 = 48.32$;
$r_2 = 133.290$ $d_2 = 0.069$;
$r_3 = 34.416$; $d_3 = 3.191$; $n_2 = 1.62299$; $\nu_2 = 58.14$;
$r_4 = 52.578$; $d_4 = 0.056$;
$r_5 = 30.924$; $d_5 = 5.152$; $n_3 = 1.60311$; $\nu_3 = 60.70$;
$r_6 = 38.925$; $d_6 = 2.500$;
$r_7 = 84.143$; $d_7 = 3.827$; $n_4 = 1.78472$; $\nu_4 = 25.71$;
$r_8 = 18.793$; $d_8 = 28.747$;
$r_9 = 52.057$; $d_9 = 3.039$; $n_5 = 1.76182$; $\nu_5 = 26.55$;
$r_{10} = 114.604$; $f = 100.0$; F 2.8; $f_B = 42.713$; $\Sigma d = 51.120$;

wherein the reference symbols r_1 through r_{10} represent the radii of curvature on the surfaces of the respective lens components, the reference symbols d_1 through d_9 designate the thicknesses of the respective lens components and airspaces therebetween, the reference symbols n_1 through n_5 denote refractive indices of the respective lens components, the reference symbols ν_1 through ν_5 represent Abbe's numbers of the respective lens components, the reference symbol f designates the focal length of the lens system as a whole and the reference symbol f_B denotes the back focal length of the lens system as a whole.

4,114,993

FINISHED SILICONE CONTACT LENSES

Edward A. Travnicek, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 650,997, Jan. 21, 1976, abandoned. This application Jan. 27, 1977, Ser. No. 763,179
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 2 Claims

1. A silicone contact lens comprising a cured, filled, silicone substrate having machined surfaces and an evenly distributed, unfilled, subsequently cured silicone coating on the substrate, wherein the substrate comprises 80 to 95% by weight of

a. a copolymer comprising

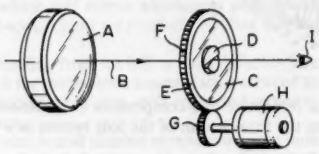
i. dimethyl siloxane,
ii. diphenyl siloxane, or phenylmethyl siloxane or mixtures thereof, and
iii. vinyl siloxane;
b. a copolymer comprising
i. dimethyl siloxane
ii. diphenyl siloxane or phenylmethyl siloxane or mixtures thereof, and
iii. siloxane having $(R)_2HSiO-$ or $-O-SiHR-O-$ groups, or both, wherein R is methyl or ethyl; with the proviso that each of fractions (a) and (b) has 6 to 16 mole percent phenyl and each contains no Part (iii) of the other;
c. 5 to 20% of a silica filler, the refractive index of said copolymer being substantially the same as the index of refraction of (c) and the coating liquid consists of a vulcanized mixture of (a) and (b).

4,114,994

FOCUS DETECTING SYSTEM

Toshihiro Kondo, 2-14-3, Kamiishihara, Chofu-shi, Tokyo, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of Japan

Filed Dec. 13, 1976, Ser. No. 750,005
Claims priority, application Japan, Dec. 11, 1975, 50-148021; Aug. 3, 1976, 51-92472
Int. Cl.² G03B 3/00
U.S. Cl. 352—139 **2 Claims**



1. A device for detecting focus in a motion picture camera which has an objective comprising a light refracting optical element located substantially on a focal plane of the objective of the optical instrument, said light refracting optical element having different parts effecting refraction of light in different directions, a transparent disc having disposed therein at the center thereof said light refracting element, means for rotating said transparent disc and said optical element in a plane parallel to the focal plane so that said different parts of said optical element are periodically brought to a point on said plane parallel to the focal plane, and viewing means for viewing an image focused by said objective from a side of the light refracting optical element opposite to the objective, said viewing means having an optical axis where said optical element rotates about said optical axis to effect ready viewing through said viewing means and where the image surrounding said light refracting optical element is viewed in focus through the transparent disc surrounding the light refracting element to facilitate focusing of the camera, a shutter mechanism, and a motor for driving said shutter mechanism and said means for rotating the camera.

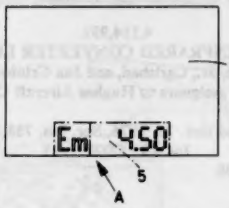
4,114,995

DIGITAL DISPLAY OF PHOTOGRAPHIC DATA

Albert Stieringer, Weil der Stadt, and Gerhard Börner, Waldenburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,459
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613154
Int. Cl.² G03D 1/60
U.S. Cl. 352—171 **15 Claims**

1. In a photographic apparatus of the type comprised of a plurality of adjustable units, in combination, a common digital display means; and information-transmitting means interconnecting the adjustable units and the common display means and operative for causing the common display means to effect a display of the setting of any selected one of the adjustable units, including selector means operative for selecting the unit whose setting is to be displayed on the common display means, the



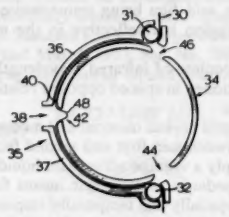
selector means comprising a plurality of display-select switch means each associated with a respective one of the adjustable units and operative when activated by the user for connecting to the common digital display means a respective one of the plurality of adjustable units.

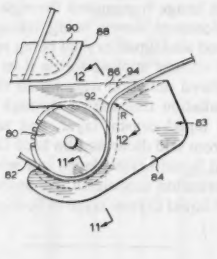
4,114,996

INLET GUIDE STRUCTURE FOR ROLLING LOOP FILM TRANSPORT MECHANISM

William C. Shaw, Streetsville, Canada, assignor to Imax Entertainment Limited, Cambridge, Canada

Filed Mar. 8, 1977, Ser. No. 775,485
Claims priority, application Canada, Apr. 2, 1976, 249505
Int. Cl.² G03B 1/00
U.S. Cl. 352—184 **2 Claims**





1. An inlet guide structure having complementary outer and inner guides for receiving photographic film from a drive sprocket of a rolling loop film transport mechanism and for guiding the film inwardly towards a path defined between the stator and the rotor of such a mechanism, the outer and inner guides having respective pairs of co-operating side faces for guiding side portions of the film, the side faces of the outer guide defining a rounded nose portion intermediate ends of these side faces, and the side faces of the inner guide defining a depression corresponding to the nose portion so that when in use the guides combine to form a passage which guides the film by contact between the side faces and the side portions of the

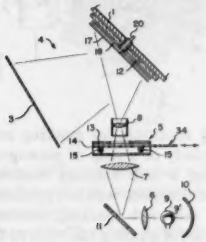
film, said nose portion combining with the depression to cause the passing film to define a transverse curve about the nose portion, said passage restraining the film to leave the passage at an acute angle to said path between the stator and the rotor so that on impact by the rotor, a loop will start to grow and any tendency for creation of a rigidifying longitudinal bend will be limited because the film is rigidified transversely by the transverse curve about said nose portion.

4,114,997

NAVIGATIONAL DEVICE

Donald M. Lunetta, 64 Pinecliff Rd., Chappaqua, N.Y. 10514

Filed Feb. 17, 1976, Ser. No. 658,683
Int. Cl.[2] G03B *21/22, 21/28*
U.S. Cl. 353—11 **7 Claims**



1. In a navigational film projection device having a screen, a light source, a lens and mirror system having at least one mirror, a film holder for holding a transparent film chart relative to said light source and lens and mirror system whereby an image of the chart is projected onto said mirror and from there onto said screen, a pair of primary course line indicators for showing course line on the image projected onto the screen and means for translating the chart and course lines relative to each other along two directions extending perpendicular to each other; the improvement comprising:

(a) means for mounting the course line indicators immediately in front of said mirror for rotation independently of each other;

(b) control means disposed remotely of the front of the mirror and connected to said course line indicators for controlling independent rotation thereof;

(c) a pair of secondary course line indicators also disposed remotely of the front of the mirror and connected to said control means for rotation therewith in full view of the user of the device, each of said secondary course line indicators being aligned in parallel relation with one of the primary course line indicators and fixed for rotation therewith; and

(d) a compass showing magnetic north and disposed in operative relation with the secondary pair of course line indicators and in view of the user.

4,114,998

COPYING MACHINE WITH REMOVABLE PHOTOSENSITIVE DRUM

Wataru Shimizu, Chigasaki, and Eiji Sawaoka, Zama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kasawaki, Japan

Filed Jan. 14, 1977, Ser. No. 759,554
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DR **5 Claims**

1. An electrophotographic copying machine comprising:

a housing with a top wall having an opening;

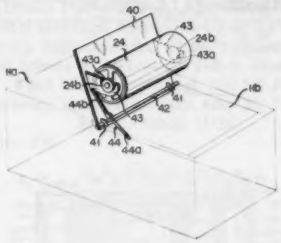
a photosensitive rotary drum accommodated in said housing;

copying means for effecting copying operation in cooperation with said drum;

covering means mounted to said top wall to close the opening therein and movable to open said housing

means for attaching the covering means to said top wall of the housing so as to be pivotable around one side of the covering means; and

supporting means mounted on said covering means and supporting said drum to shift the drum outside of said housing through the opening by moving said covering



means to open said housing, including a pair of supporting members projected from both sides of said drum, and a pair of supporting arms each having one end fixed on said covering means and the other end supporting said supporting member, said supporting members each including a circular body and said supporting arms each including a cut-away portion at one side having a curved surface so as to support a circular body in said housing and while outside said housing.

4,114,999

APPARATUS FOR MAKING PLATES FOR PRINTING

Masahiro Kogiso, Kokubunji; Minehiro Sakata, Hachioji; Hatsuo Oda, and Tamio Iwamoto, both of Hino, all of, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Claims priority, application Japan, Nov. 14, 1975, 50-13745; Mar. 26, 1976, 51-37098 [u]; Mar. 26, 1976, 51-37099[u]
Filed Nov. 9, 1976, Ser. No. 740,086
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **25 Claims**

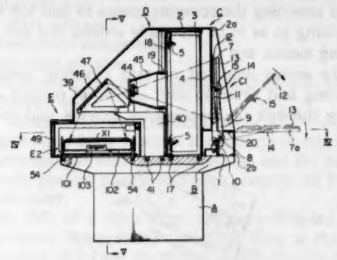
1. An electro-fax type of apparatus for making a plate for offset printing, comprising:

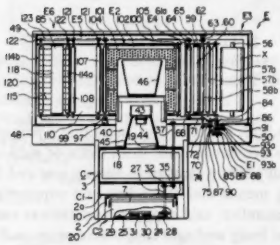
a manuscript table section comprising a first housing having a vertical exposure window formed in the front thereof, a manuscript table unit mounted on the front side of said first housing and adapted to cover said exposure window and to be laid down on the front side of said exposure window so that a manuscript is placed face upward thereon and, then, set face backward at said exposure window and lamp means accommodated in said first housing for illuminating said exposure window;

an optical system section comprising a second housing, a projection lens accommodated in said second housing and located in the rear of said exposure window to project the picture of the manuscript in the backward direction, and a mirror accommodated in said second housing and located in the rear of said projection lens to reflect the projected picture in the downward direction, and;

a master paper processing system section comprising a third housing and a system accommodated in said third housing for processing a master paper to be made into said plate, said master paper-processing system comprising a plurality of components including a paper feeding mechanism, an electrically charging device, an exposure station located directly under said mirror, a wet developing device and a drying and discharging device, said components being so arranged that said master paper is forwarded

along a substantially straight path extending in a horizontal plane and in a lateral direction to the apparatus which





is perpendicular to the direction of the optical axis of said projection lens.

4,115,000

APPARATUS FOR NOTCHING OF WEBS

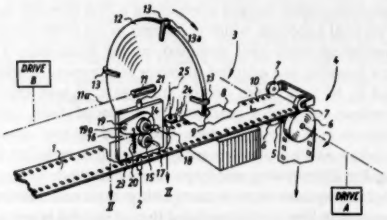
Klaus Mischo, Munich, and Traugott Liermann, Unterhaching, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,595

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619375

Int. Cl.[2] G03B *29/00*; B26D *1/12*

U.S. Cl. 355—29 **12 Claims**



1. In an apparatus for notching an edge of an elongated web, particularly of a strip of photographic film, a combination comprising means for advancing an elongated web in a path; and means for notching a longitudinal edge of the web, including a wheel mounted for rotation adjacent said path, at least one punching die on said wheel adjacent the periphery thereof and having a punching portion bounded by a first severing edge shaped to correspond to a notch to be formed, and a stationary counterpunch provided with a cutout shaped to matingly receive said punching portion and being bounded by a second severing edge which cooperates with said first severing edge to punch notches into the web during rotation of the wheel.

4,115,001

WEB MARKING APPARATUS

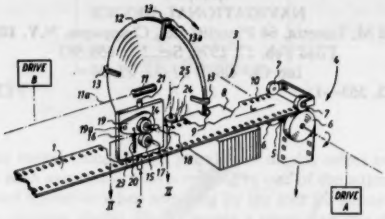
Klaus Mischo, Munich; Traugott Liermann, Unterhaching, and Karel Pustka, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,596

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619374

Int. Cl.[2] G03B *29/00*; B65H *25/26*

U.S. Cl. 355—29 **13 Claims**



1. In a web-marking apparatus for marking an edge of an elongated web, particularly of a strip of photographic film, a combination comprising a web marking station; advancing means for advancing an elongated web in a predetermined path towards and through said web marking station; and guide means adjacent said path for guiding said web so that the same travels in a predetermined orientation through said station, said guide means comprising a pair of rollers defining a nip through which a longitudinal edge portion of the web passes, and means mounting said rollers for rotation about a pair of axes which are permanently parallel with one another and which include with the direction of web travel an angle that opens in said direction and towards said longitudinal edge.

4,115,002

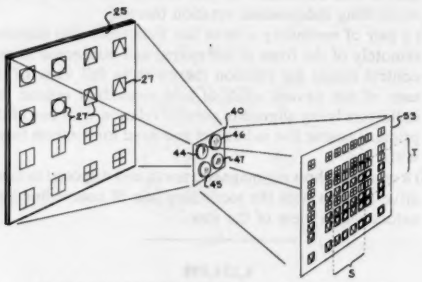
METHOD AND APPARATUS FOR PHOTOGRAPHIC RECORDATION OF MULTIPLE IMAGES

Thomas D. Clark, 4232 River Rd., Toledo, Ohio 43614

Filed May 2, 1977, Ser. No. 792,687

Int. Cl.[2] G03B *27/44, 27/62, 27/32*

U.S. Cl. 355—54 **13 Claims**



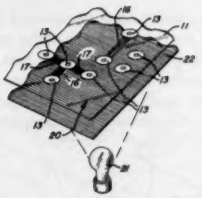
5. An apparatus for reproducing separate and non-related graphic originals as a group of high information density images of a selected reproduction ratio comprising a frame having means for retaining the originals in a first widely spaced relationship and in a first arrangement as a first group, a lens support, and a focal plane defining a central traget area on said plane, means for locating said lens support between said frame and said focal plane, and a plurality of lens units positioned on said lens support whereby each of said lens units projects a selected and discrete segment image of said first group on said central target area and whereby a cumulative image from all of

said lens units in said target area comprises separate images of the originals in a second more closely spaced relationahip and a second arrangement as a second group distinct from said first group.

4,115,003
GRAPHIC AID AND METHOD AND SYSTEM OF MAKING REPRODUCTIONS THEREFROM

Robert W. Nachtrieb, Villa Park, Ill., assignor to Fotel Inc., Villa Park, Ill.

Filed Jul. 6, 1976, Ser. No. 702,419
Int. Cl.² G03B *27/02, 27/32*
U.S. Cl. 355—133 **20 Claims**



1. A graphic aid for reproducing a first graphic pattern and a second graphic pattern in registry therewith comprising;

a diaphanous sheet,

a first pattern of effectively light absorptive material on said sheet, defining portions of said first graphic pattern,

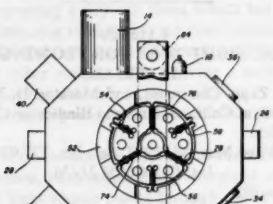
a second pattern of opaque and effectively light reflective material on said sheet, in registry with said first pattern and defining simultaneously, portions of said first graphic pattern and said second graphic pattern, and

removable means selectively underlying said diaphanous sheet to render said sheet effectively light absorptive whereby said diaphanous sheet simultaneously includes thereon said pattern-defining material for each of said patterns and said second pattern has a contrasting light reflective characteristic relative to said first pattern and said sheet and underlying means such that light may be reflected from said second pattern to define a separately distinguishable second graphic pattern.

4,115,004
COUNTERBALANCED OSCILLATING RING LASER GYRO

Thomas J. Hutchings, Thousand Oaks, and Virgil E. Sanders, Newbury Park, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Nov. 15, 1976, Ser. No. 741,619
Int. Cl.² G01B *9/02;* G01P *9/00*
U.S. Cl. 356—106 LR **9 Claims**



1. A compact laser gyro assembly of improved resolution comprising:

a ring laser structure including apertures and mirrors which define a rectangular ring laser path;

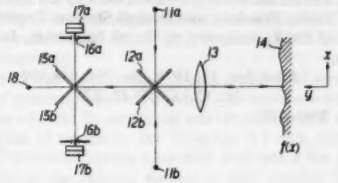
a case housing said laser structure; and

electrical motor driving means mounted within the area bounded by the ring laser path in said laser structure for mechanically oscillating said laser structure with respect to said case.

4,115,005
METHOD FOR OPTICALLY MEASURING A ROUGHNESS PROFILE OF SURFACE

Ryoji Murata, Higashiyamato, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 20, 1975, Ser. No. 560,189
Claims priority, application Japan, May 20, 1974, 49-56274
Int. Cl.² G01B *11/30*
U.S. Cl. 356—120 **6 Claims**



1. A method for optically measuring a roughness profile of a surface, comprising:

projecting through a converging optical system at least two discrete light rays from two light sources on a surface to be measured, one of said light rays being focused before and the other behind said surface;

receiving reflections of said light rays by photoelectric means to produce two different electric signals related to the respective intensity of the reflections of said light rays, said reflections being strongest when said light rays are in focus at said surface and decreasing in intensity when said light rays are out of focus with said surface;

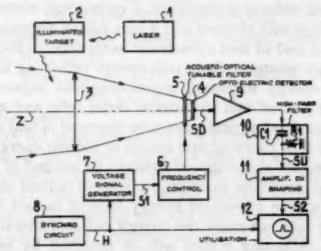
detecting a roughness profile of said surface on the basis of the difference of said electric signals; and

moving said light rays along said surface to obtain a continuous roughness profile of said surface.

4,115,006
ARRANGEMENT FOR DETECTING LIGHT SOURCES

Jean-Claude Reymond, and Alain Bellissant, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 9, 1977, Ser. No. 767,187
Claims priority, application France, Feb. 13, 1976, 76 04078
Int. Cl.² G01B *11/26;* H01J *39/20, 3/14*
U.S. Cl. 356—152 **8 Claims**



1. An arrangement for detecting a light source having a known expected radiation spectrum in an observed field, com-

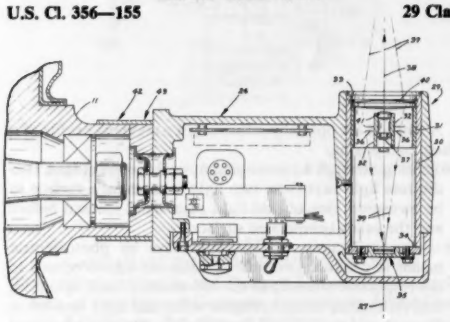
prising: optical receiving means for focusing incident light radiation originating from said field and consisting of ambient interference radiation and said expected radiation; optical filtering means comprising an acousto-optical tunable filter controlled by a control device to scan periodically and according to a predetermined law of change in frequency with time the frequency of the filter through an operating band which corresponds substantially to that of the said expected spectrum so as successively to filter the various received wavelengths therein; opto-electrical detection means for detecting said filtered and focused incident radiation; and a processing circuit for processing the detected signals and comprising a high-pass filter of predetermined cut-off frequency to eliminate the D.C. component due to the ambient interference radiation and to provide a periodic useful signal due to radiation from said source.

4,115,007

VEHICLE WHEEL ALIGNMENT SYSTEM

Carl L. Thiele, Pasadena, and Haskell Shapiro, Corona del Mar, both of Calif., assignors to Royal Industries, Inc., Osseo, Minn.

Filed Jan. 14, 1976, Ser. No. 648,890
Int. Cl.[2] G01B *11/275*
U.S. Cl. 356—155 **29 Claims**



1. In apparatus of the class above described, the combination comprising:

a. a level work surface for receiving a vehicle, components of which are to be aligned with respect to an axis of said vehicle;

b. energy reflecting means positioned in a predetermined attitude to an axis of said vehicle;

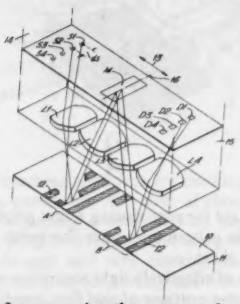
c. means, including a source of radiant energy and energy detecting means, said means adjustably disposed on a component of said vehicle, having an axis of which is to be positioned in predetermined relationship to an axis of said vehicle, said means having an optical axis to be adjustably disposed in predetermined relationship with the axis of said component and including an element which attaches to said vehicle component, a cylindrical outer tube disposed in said element and a lens means disposed adjacent to one end of said cylindrical outer tube to focus radiant energy returning from said energy reflecting means onto said energy detecting means disposed adjacent to the other end of said cylindrical outer tube and a coaxially disposed cylindrical inner tube disposed in said cylindrical outer tube carrying said source of radiant energy and said lens means also disposed adjacent to one end of said cylindrical inner tube to diverge a beam of radiant energy from said source of radiant energy located in said cylindrical inner tube whereby the energy radiated toward said energy reflecting means will be detected by said energy detecting means in a predetermined manner when the optical axis of said means is in a predetermined attitude with respect to the plane of said energy reflecting means, said source of radiant energy and said energy detecting means having coaxially effective axes of operation coincident with said optical axis.

4,115,008

DISPLACEMENT MEASURING APPARATUS

Alexander Turnbull Shepherd, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

Filed May 6, 1977, Ser. No. 794,523
Claims priority, application United Kingdom, May 8, 1976, 19049/76
Int. Cl.[2] G01B *11/26, 9/02*; G02B *27/38*
U.S. Cl. 356—172 **4 Claims**



1. Apparatus for measuring the extent and sense of the relative movement of a first object in one of two opposite directions with respect to a second object, which includes a reflecting grating carried by one of the two relatively movable objects with the grating lines substantially at right angles to the direction of relative movement, and an optical system carried by the other of the two relatively movable objects and comprising a light source arranged to produce at least three light beams equally spaced in a direction substantially parallel to the grating lines, a first lens having the light source located in its focal plane and arranged to project the light beams onto an area of the grating for reflection thereby, a second lens through which the reflected light beams pass, a mirror located in the focal plane of the second lens and having a uniform twist about an axis substantially parallel to the grating lines such as to displace each light beam from the next in a plane normal to the grating lines by a distance measured at the grating surface equal to one quarter of the grating pitch, a third lens having the mirror located substantially in its focal plane and arranged to project the light beams reflected by the mirror onto a different area of the grating for further reflection thereby, a fourth lens through which the light beams pass after said further reflection from the grating, and at least three light-sensitive devices located in the focal plane of the fourth lens so that each detector receives a separate one of the light beams.

4,115,009

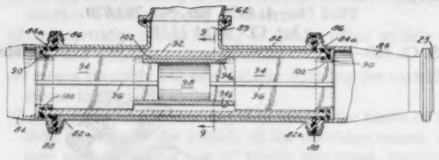
OPTICAL SIGHT TUBE FOR FLOWING FLUID MATERIALS

Lawrence C. Zepp, Claremont, and Marston D. Mosteller, Alhambra, both of Calif., assignors to Bindicator Company, Port Huron, Mich.

Filed Mar. 14, 1977, Ser. No. 777,075
Int. Cl.[2] G01N *21/26*
U.S. Cl. 356—201 **11 Claims**

1. Apparatus for optically measuring a preselected characteristic of fluids flowing in a confined path comprising a cylindrical conduit disposed to define at least a portion of said confined fluid path, means providing an optical window in a wall of said conduit, means for optically detecting said material characteristic through said window, reflective means providing an arcuate reflective surface adjacent said window and defining a test material flow path between said surface and said

window, said reflective means being mounted within said conduit by means engaging an inside cylindrical wall of said conduit, and means for selectively adjusting the spacing between said window and said reflective surface including means for selectively disengaging said mounting means from said



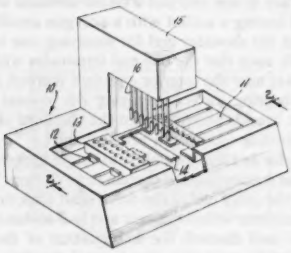
conduit wall, said mounting means being rotatable coaxially within said conduit when disengaged from said conduit wall thereby to vary said spacing, said reflective means being adapted to reflect measurement optical beams incident upon said surface through said window and test material back through test material and said window.

4,115,010

AUTOMATED PLATE READER

William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 3, 1976, Ser. No. 655,318
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—201 **9 Claims**



1. Apparatus adapted to carry out one or more viral assays simultaneously comprising

carrier means including a plurality of test wells for holding and transporting a dry cell sheet which has been stained after undergoing viral attack, the concentration of virus in each well of an individual assay being different from that of every other well so as to provide a serial titration of virus concentration,

a light source disposed beneath the virus growth carrier means,

a plurality of photo sensors disposed above the virus growth carrier means, each sensor being energized when the light from the light source passes through the test well below that sensor,

means for lowering the photo sensors into the test wells and measuring light transmittance of the dry, stained cell sheet when the photo sensors are in lowered position, and for raising the photo sensors therefrom,

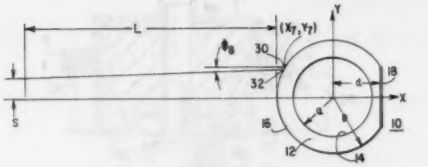
and digital computer means for recording the light transmittance measurements of the photo sensors.

4,115,011

CUVETTE CONFIGURED FOR PHOTOANALYSIS USE

Albert Brunsting, Miramar, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Oct. 7, 1976, Ser. No. 730,577
Int. Cl.[2] G01N *1/10*
U.S. Cl. 356—246 **15 Claims**



1. An afocal cuvette for containing a fluid to be analyzed by passage of light therethrough, said cuvette adapted to be positioned at a predetermined distance L from a light receptor, said cuvette comprising:

a hollow cylindrical structure having a structural axis and an axis of symmetry defined by an XYZ cartesian coordinate system wherein the structural axis lies along the Z axis and the plane of symmetry lies along the XY axis, said cylindrical structure having a circular wall and a flat portion formed on the exterior surface of said circular wall extending in a plane parallel to the structural axis, at least said circular wall being optically transparent, said circular wall having a circular inner surface at a radius *a* about the structural axis for defining a compartment to contain the fluid and a circulr outer surface having a radius *b*, said flat portion being positioned a predetermined radial distance *d* from said structural axis, said cuvette capable of receiving incident light along an incident light path defined as an incident beam formed of a plurality of rays from a light source which is located at a distance spaced from the cuvette and the beam having a first optical axis, the beam continuing through said cuvette wall and the compartment to the said flat portion and at least a portion of the beam being reflected back from said first portion as a reflected beam also formed as a plurality of reflected rays, the beam having a second optical axis and lying along an exiting light path defined as leading to the light receptor which is located spaced offset from the optical axis of the incident light beam and from the light source, the first and second optical axes being on opposite sides of said plane of symmetry, the indices of refraction of the media intercepted by said incident and exiting light beams being related to said radii and predetermined distance whereby to effect definition of the rays forming said incident and exiting light beams into and out from said cuvette as substantially parallel within their respective beams.

4,115,012

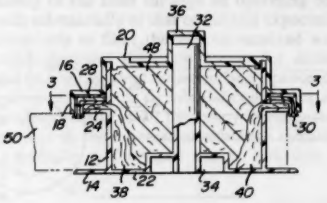
PRINTING RIBBON SPOOL

Walter Ploeger, Jr., and Jeanne M. Ploeger, both of North Bellmore, N.Y. 11710

Filed Jan. 10, 1977, Ser. No. 758,279
Int. Cl.[2] B41J *31/16*
U.S. Cl. 400—202.1 **8 Claims**

1. A spool for replenishing ink in a printing ribbon comprising an annular spool body having a hub and a pair of spaced radially outwardly directed flanges, said flanges being spaced apart so as to accommodate a ribbon therebetween, an annular pad of deformable material selected from the group consisting of woven and knitted material supported by said body in a position so that an outer peripheral edge portion of the pad can have contact with the side edge of at least a portion of the ribbon disposed between the flanges, a reservoir supported by said body, a wick of deformable material including at least one

layer of fabric selected from the group consisting of woven fabric and knitted fabric, said wick extending between the reservoir and pad for transferring ink from the reservoir to the pad by capillary action, said wick including two layers of nylon fabric bonded only at their side edges to a layer of ink



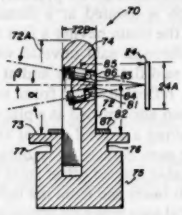
impervious polymeric plastic film disposed between the layers of the fabric, means defining at least one access opening to the reservoir and through which said wick extends, said opening being substantially smaller in transverse dimensions than the transverse dimensions of the wick, and said body including means to provide a hermetic seal for said reservoir.

4,115,013

END-OF-RIBBON SENSOR DEVICE

Jerry W. Hedstrom, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,794
Int. Cl.[2] B41J *35/36*
U.S. Cl. 400—249 **7 Claims**



1. In a serial printer having a platen, a laterally movable carriage for traversing a print line, a ribbon cartridge having a supply of ribbon therein and mounted on a support means, printhead means and said ribbon cartridge and ribbon cartridge support means supported on said carriage, an improved end-of-ribbon sensor comprising:

a mounting means;

a housing extending transverse to and a predetermined distance from a plane formed by said mounting means;

a radiation source positioned within said housing; and

a radiation responsive device positioned within said housing;

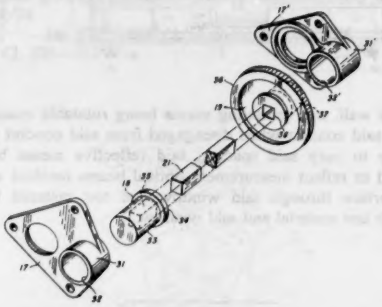
said mounting means attached to said ribbon cartridge support means such that said housing is positioned within the interior volume of the ribbon cartridge, in such proximity to the ribbon that the ribbon is illuminated by radiation from said radiation source and said radiation responsive device provides a first output proportional to the radiation reflected thereto from said ribbon, said radiation responsive device provides a second output, greater in magnitude than said first output, when receiving radiation reflected from a reflective marker positioned on the ribbon at a predetermined distance from the end of the ribbon to indicate the presence of an end portion of the ribbon.

4,115,014

IMPACT PRINTER DRIVESHAFT GEAR AND BEARING ASSEMBLY

James Carlos Wood, Houston, and Frances Adolph Felcman, Richmond, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 4, 1977, Ser. No. 793,570
Int. Cl.[2] B41J *11/30*
U.S. Cl. 400—611 **9 Claims**



1. An impact printer having a frame with a first and second sidewall, and a rotatable drive shaft with a polygon cross section for actuating web feed means mounted thereon, positioned between the first and second sidewalls, the improvement comprising:

(a) a first bracket assembly, including a hub with a journal bearing formed therethrough, mounted on the first sidewall;

(b) a second bracket assembly, including a hub with a journal bearing formed therethrough, mounted on the second sidewall;

(c) a bushing assembly having an outer circular bearing surface at one end and a raised shoulder at the other end, and having a socket with a polygon cross section formed from the shoulder end for receiving one end of the drive shaft, such that the one end terminates within the bushing socket near the interior end wall thereof, the outer circular bearing surface engaging the journal bearing of the first bracket assembly and the shoulder abutting one end of the hub of the first bracket; and

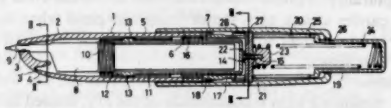
(d) a gear and hub assembly, having a socket with a polygon cross section formed therein from the gear end, for receiving the other end of the drive shaft such that the other end terminates within the gear and hub socket near the interior end wall thereof, the hub portion of the gear and hub assembly engaging the journal bearing of the second bracket assembly and the gear portion of the gear and hub assembly abutting the hub of the second bracket assembly.

4,115,015

RETRACTABLE PEN WITH INTERNAL TIP SEATING

Osamu Torii, Kyoto, Japan, assignor to Ancos Co., Ltd., Osaka, Japan

Filed Apr. 11, 1977, Ser. No. 786,743
Int. Cl.[2] B43K *5/16, 7/12, 24/08*
U.S. Cl. 401—110 **5 Claims**



1. A retractable pen, comprising:

(a) a body cylinder,

(b) a slide member slidably but non-rotatably disposed within the body cylinder and extending outwardly from both ends thereof, the front end of the slide member defining an axially offset open hole and an axially offset internal blind hole,

(c) spring means biasing the slide member toward a retracted position within the body cylinder,

(d) ink cartridge means having an axially offset writing tip disposed within the slide member,

(e) means rotatably but non-slidably coupling the cartridge means to the body cylinder,

(f) a cam wall and a cam ring disposed on the inside of the slide member or the outside of the cartridge means, the cam wall defining a pair of axially elongated, angularly spaced grooves joined at their one ends by configured edges, and the cam ring defining a configured edge generally matched to that of the cam wall but spaced therefrom, and

(g) cam follower means disposed on the outside of the cartridge means or the inside of the slide member, respectively, and operatively engaged in the path defined by and between the cam wall and the cam ring, whereby the depression and release of the slide member sequentially effects the extension thereof, the rotation of the cartridge means and tip, and the retraction of the slide member, to thereby transfer the tip between a writing position whereat it extends through the open hole in the slide member and a retracted position whereat it is protectively seated in the internal blind hole.

4,115,016

SHAFT FASTENING ASSEMBLY

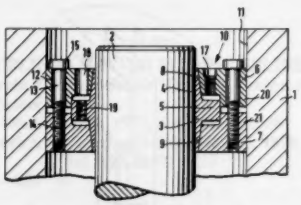
Ralph Muellenberg, Nelkenstrasse 6, Huelchrath, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,674

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 7637344[U]

Int. Cl.² F16D *1/06*

U.S. Cl. 403—16 **6 Claims**



1. A shaft fastening assembly comprising:

a double tapered ring having a cylindrical circumferential surface, and two opposing conical surfaces on opposite sides of a radially extending protrusion, said double tapered ring substantially surrounding a shaft;

two secondary tapered rings each having a cylindrical circumferential surface, and a conical surface cooperating with a different conical surface of said double tapered ring, and a circumferential shoulder portion on at least one of said secondary tapered rings overlapping said radially extending protrusion on said double tapered ring;

a plurality of tension bolts for tightening together said conical surfaces of said double tapered ring and said secondary tapered ring arranged in a first pitch circle surrounding said shaft; and

a plurality of release bolts for releasing said conical surfaces of said double tapered ring and said secondary tapered rings arranged in a second pitch circle surrounding said shaft;

said first and second pitch circles being located at different radial distances from said shaft.

4,115,017

DEVICE FOR DRILLING HOLE OF PREDETERMINED DEPTH

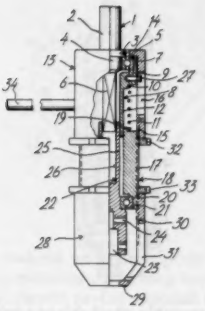
Wilhelm H. Wilhelmsson, Fack 94, 572 00 Oskershamn, Sweden

Filed May 13, 1976, Ser. No. 686,443

Claims priority, application Sweden, Mar. 17, 1976, 7603336

Int. Cl.² B23B *47/18*

U.S. Cl. 408—14 **1 Claim**



1. A device, for incorporation between an axially movable drill spindle and a drill bit, comprising:

(i) a driving member for connection to the drill spindle so as to move axially and rotationally with said drill spindle

(ii) a guiding member disposed about said driving member and mounted thereon by bearing means which permit relative rotation but prevent relative axial movement

(iii) a drill holding member, to receive the drill bit, engaged with said driving member so as to be relatively axially slidable but keyed against relative rotation, said drill holding member including a portion which is slidable axially between the drill holding member and the guiding member,

(iv) an assembly of a housing and a sleeve, the sleeve being externally threaded and the housing being internally threaded and engaged by its threading on an end of the sleeve so as to be adjustable axially, said assembly being positioned about the driving member, the guiding member and the drill holding member, the sleeve being coupled to the drill holding member by an axial thrust bearing, the guiding member being axially slidable in the housing but keyed against relative rotation,

(v) compression spring means positioned between the guiding member and the sleeve for transmitting from the driving member to the drill holding member an axial thrust which is adjustable by axial adjustment of the housing on the sleeve,

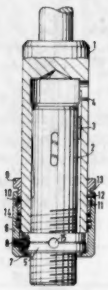
(vi) an abutment member which is internally threaded and is engaged on the other end of the sleeve, said abutment member being positioned about and extending axially beyond the drill holding member to abut a workpiece, axial adjustment of the abutment member with respect to the sleeve serving to adjust the extent to which the drill holding member may approach the workpiece and thereby adjusting the depth to which the drill bit may enter the workpiece,

(vii) stop means coupled to the housing, the sleeve, and the abutment means for preventing rotation thereof when the driving member rotates.

4,115,018
SLEEVE PLUG FOR ATTACHMENT TO A SPINDLE HEAD

Gustav Siegler, Kirchheimer Strasse 34, D 7317 Wendlingen, and Eberhard Jahn, Schlosserweg 10, D 7300 Esslingen-Wiflingshausen, both of Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,447
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 7632247[U]
Int. Cl.[2] B23B *31/10, 5/22*
U.S. Cl. 408—239 A 6 Claims



1. A sleeve-plug assembly attachable to a spindle head of the type having a generally cylindrical body and a bore extending axially into one end thereof, the assembly including the combination of

an adjusting nut;

an adjustable adapter insertable into said bore, said adapter having a threaded end protruding from the spindle head to threadedly receive said adjusting nut;

a sleeve assembly slidable onto the end portion of the spindle head over said nut, said sleeve assembly comprising

an axially shiftable carrying bushing having aperture means for receiving a plurality of locking balls annularly disposed around said bushing, the portion of said bushing adjacent said balls having a radial thickness smaller than the ball diameters,

a locking bushing having an end portion surrounding said nut and a sleeve portion generally surrounding the portion of said carrying bushing including said balls, said sleeve portion having means defining an inwardly facing conical surface with the larger diameter thereof being toward said nut, and

spring means extending between said locking and carrying bushings for urging said carrying bushing away from said nut.

4,115,019
METAL COUPLING OR OTHER METAL ATTACHMENT AND METHOD FOR WELDING IT TO A METAL TUBE OR OTHER METAL SUPPORT

Calvin C. Swisher, Sr., Genesee Depot, Wis., assignor to Wisconsin Centrifugal, Inc., Waukesha, Wis.

Filed Mar. 18, 1977, Ser. No. 779,286
Int. Cl.[2] B25G *3/34*
U.S. Cl. 403—270 8 Claims

1. A metallic attachment adapted to be welded to the external surface of a metal pipe or tube comprising:

(a) a generally cylindrical metallic body including

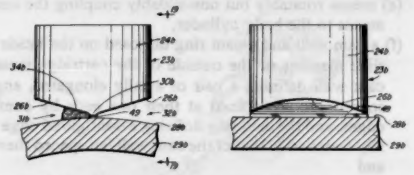
(1) a base having

a. a beveled bottom surface defining a weld surface area adapted to be welded to the said external surface of the said metal pipe or tube and having

b. a divider portion in the form of a keel or land extending downwardly from and generally diametrically across the said beveled bottom surface of the said base centrally thereof and dividing the said weld surface area of the said base into two substantially coequal component weld surface areas on opposite sides of the said divider portion;

(2) the said keel or land having opposite generally parallel sides;

(3) the said generally cylindrical body of the said metallic attachment having an outer peripheral wall surface; and

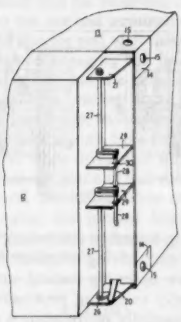


(4) each of said substantially coequal component weld surface areas of the said base being defined by one side of the said keel or land, the outer peripheral wall surface of the said generally cylindrical body of the said metallic attachment, the said beveled bottom surface thereof, and a portion of the adjacent external peripheral wall surface of the said metal pipe or tube.

4,115,020
CLAMP

Stephen Walter Langsford, Picnic Point, Australia, assignor to Overseas Containers Australia Pty Limited, Australia

Filed Oct. 14, 1976, Ser. No. 732,334
Claims priority, application Australia, Oct. 15, 1975, PC3581
Int. Cl.[2] B25G *3/18;* A44B *21/00*
U.S. Cl. 403—322 7 Claims



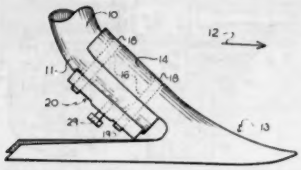
1. A clamping arrangement comprising support means, at least one elongated clamping arm pivoted intermediate its opposed ends to said support means for turning movement with respect thereto between clamping and unclamping positions, said arm having on one side of its pivotal connection to said support means a clamping portion and on the other side of its pivotal connection to said support means an elongated operating portion, torsion spring means pivotally connected to said support means and spaced from said operating portion of said clamping arm, and cam means fixed to said torsion spring means to be turned thereby and engaging said operating portion of said clamping arm for turning the latter from a non-clamping to a clamping position where displacement of said clamping arm from said clamping to said non-clamping position is resisted by said torsion spring means.

4,115,021

IMPLEMENT ATTACHMENT TO SHANK

George N. Loch, Box 14, Glendon, Canada (TOA 1PO)

Filed Apr. 19, 1977, Ser. No. 788,734
Claims priority, application Canada, Apr. 26, 1976, 251283
Int. Cl.[2] B25G *3/00*
U.S. Cl. 403—353 12 Claims



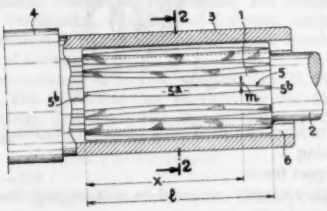
1. Means for detachably securing an implement such as a cultivator tooth, shovel or the like, to the lower end of a cultivator shank in which said implement is supported against the lower end portion of the shank in offset relationship, said implement and said shank being apertured, the apertures being in axial alignment when said implement is supported against said shank as aforesaid; said means comprising in combination at least two connecting bolts one each engaging through sets of aligned apertures in the associated implement and shank, head means on one end of each of said bolts, limiting the endwise movement of said bolts through said apertures, a locking plate having keyhole shaped slots formed therein and engageable over the other ends of said bolts, means adjacent said other ends of said bolts engaging through said keyhole slots in sliding locking relationship therewith, and a set screw screw threadably engaging through said locking plate and bearing against said shank to clamp said implement and said locking plate to said shank when said set screw is tightened.

4,115,022

COUPLINGS HAVING SLIDING SPLINES

Michel A. Orain, Conflans-Sainte Honorine, France, assignor to Glaenzer Spicer

Filed May 10, 1977, Ser. No. 795,556
Claims priority, application France, May 17, 1976, 76 14813
Int. Cl.[2] F16D *1/10*
U.S. Cl. 403—359 7 Claims



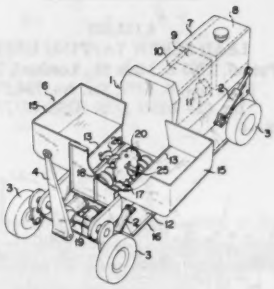
1. A coupling device comprising a male splined member and a female splined member having the splines thereof interengaged, the splines of at least one of said members being modified and having a thickness which is maximum in an intermediate part of the splines and progressively decreases to ends of the splines, the profile of the splines of said one of said members being such that, upon application of a given torgue, the pressure produced in the zones of contact between the interengaged splines is substantially constant throughout the interengaged length of the splines.

4,115,023

PAVING MATERIAL AGITATION APPARATUS FOR USE IN WATER CHANNEL FORMING MACHINE

Mitsuyoshi Wada, Yamato-Takada; Hideyuki Shimada, and Koji Ohta, both of Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 8, 1978, Ser. No. 876,147
Int. Cl.[2] E01C *11/28*
U.S. Cl. 404—98 4 Claims



1. A paving material agitation apparatus for use in water channel forming machines comprising hopper means adapted to accommodate therein paving materials to be laid,

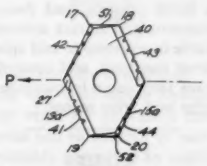
a plurality of first screw means spaced apart with each other, each of said screw means being extended in a direction parallel to a direction of the water channel forming machine to be advanced, a plurality of rotary drive means each being secured to one end of said first screw means, respectively, agitation impeller means rotatably engaged with one of said first screw means, rotary shaft means rotatably supported by said hopper means, said agitation impeller means being fixedly secured to said rotary shaft means so as to be rotated therewith, and second screw means formed on said rotary shaft means.

4,115,024

SPADE DRILL BLADE

Reiner W. Süssmuth, Neu Isenburg, Germany, assignor to Amtel, Inc., Providence, R.I.

Filed Mar. 4, 1977, Ser. No. 774,511
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608808
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—114 5 Claims



1. A double edge spade drill blade comprising a block having parallel top and bottom plane faces, a first pointed cutting end formed on one edge of the block with a pair of cutting edges effected to drill a hole in the workpiece when the blade is rotated and fed axially against a workpiece, a second pointed cutting end located on an opposite edge of the block with a pair of cutting edges, said pointed ends located on and defining a rotational axis parallel to the plane faces, said blade having parallel side faces being formed to guide the blade into the drilled hole, said cutting edges extending from the pointed

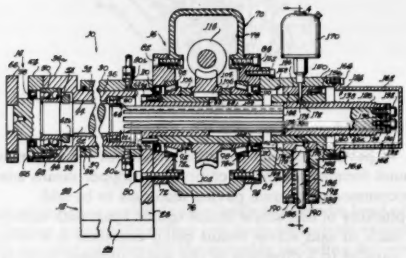
ends outwardly to the side faces, said side faces having a shape of raised form and narrow cross section to bear against the inner wall of the workpiece bore substantially adjacent said cutting edges in a lateral surface region which extends in a diagonal plane extending substantially through the central axis of rotation of the blade and intersecting the ends of the cutting edges at the side faces wherein said side faces bear against said workpiece bore at spaced points along said raised form at the intersection of said side faces and said ends of the cutting edges.

4,115,025

LEAD SCREW TAPPING UNIT

Robert J. Petroff, 1703 S. Main St., Lombard, Ill. 60148

Filed Apr. 4, 1977, Ser. No. 784,576
Int. Cl.[2] B23G *1/16*; B23B *47/27*
U.S. Cl. 408—6 **9 Claims**



1. In a lead screw tapping unit, the combination comprising housing means, a spindle supported by said housing means for longitudinal movement, said spindle being adapted to support a thread forming tool thereon for selective engagement with a workpiece, reversible rotary drive means, means connecting said drive means to said spindle for effecting rotation of said spindle upon energizing said drive means, lead nut means supported by said housing means and having a threaded bore extending longitudinally therethrough, said lead nut means being longitudinally movable relative to said housing means, biasing means supported by said housing means and operatively associated with said lead nut means to bias said lead nut means to a predetermined position relative to said housing means, lead screw means cooperative with said spindle for rotation and longitudinal movement therewith, said lead screw means being threadedly cooperative with said threaded bore in said lead nut means such that rotation of said lead screw means relative to said lead nut means effects longitudinal movement of said spindle relative to said lead nut means, and control means operatively associated with said drive means and adapted to selectively energize said drive means to advance said spindle toward a workpiece, retract said spindle from the workpiece to its initial position, and deenergize said drive means after a predetermined retract movement, said baising means being movable in response to said spindle undergoing a predetermined thrust overload, said control means including safety switch means responsive to movement of said biasing means to deenergize said drive means.

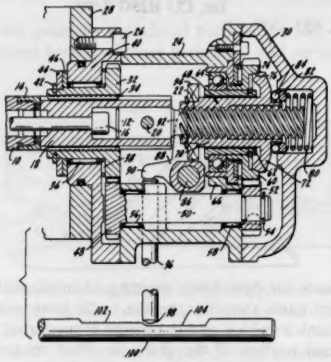
4,115,026

LEAD SCREW TAPPING ARRANGEMENT FOR USE WITH SELF-OPENING DIE HEADS AND COLLAPSIBLE TAPS

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 602,188, Aug. 6, 1975, abandoned. This application Jul. 6, 1976, Ser. No. 702,946
Int. Cl.[2] B23G *1/18*
U.S. Cl. 408—10 **16 Claims**

1. Means for controlling the advance of a thread forming member including a unidirectionally constant speed spindle, a thread forming member on said spindle, a lead screw and a nut threadedly mounted thereon, said lead screw and nut thread having a helix angle such that the nut is freely rotatable relative thereto in response to axial movement of the lead screw, one of



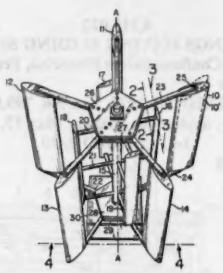
the nut and lead screw being attached to the spindle, and means for independently controlling rotation of the other of said nut and lead screw through a clutch member which member is driven by the unidirectional constant rotation of said spindle to thereby control axial movement of said spindle.

4,115,027

VERTICAL WINDMILL

Robert Nason Thomas, 80 Lincoln Dr., Ventura, Calif. 93003

Continuation-in-part of Ser. No. 649,827, Jan. 16, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 758,022
Int. Cl.[2] F03D *7/06*
U.S. Cl. 415—2 **8 Claims**



1. A windmill for producing power in a moving body of air, comprising

a support frame;

a shaft rotatably mounted to said support frame about a vertical axis;

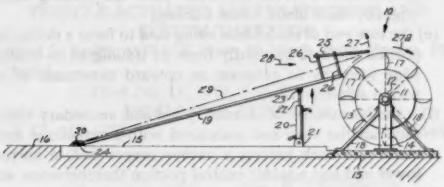
a plurality of elongate airfoils mounted to said shaft and each having a cross-section designed to provide aerodynamic lift when experiencing relative motion to a body of air; and

a plurality of elongate stators mounted to said support frames and standing vertically, outwardly from said airfoils, each said elongate stator being spaced circumferentially about said vertical axis and each said elongate stator having an elongate cross-section with the major dimension of said elongate cross-section extending substantially radially from said vertical axis.

4,115,028
WIND POWERED CYLINDER

Anton E. Hintze, 103 Margaret La., Grass Valley, Calif. 95945

Filed Jun. 30, 1977, Ser. No. 811,544
Int. Cl.[2] F03B 3/18
U.S. Cl. 415—2 2 Claims



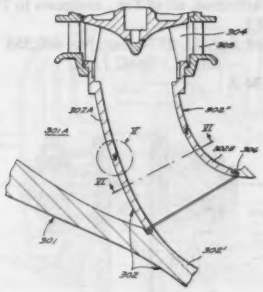
1. A wind powered cylinder, comprising a longitudinal shaft having radially and equally spaced-apart vanes secured therein for being driven by natural wind force, support bracket means secured to the cylinder for mounting it in a low horizontal profile to a base, stationary on a ground surface, a panel pivotally and elevatably secured to said base, with parallel, spaced-apart and sidewardly movable, flexible vertical vanes thereon, for directing a wind to said cylinder, a plate secured to said panel, providing air compression means for air directed to the cylinder, and a means for elevating and lowering said panel and said plate with respect to the outer periphery of said cylinder; said radially and equally spaced-apart vanes of said cylinder being fixedly secured to said longitudinal shaft, and said shaft being journaled within bearings secured within said support bracket means, said support bracket means being fixedly secured to said base, said panel being hinged to a top of said base at one end, and being freely elevatable at its opposite end which is in close proximity with the outer periphery of said cylinder, hydraulic cylinders pivotally secured in brackets fixedly secured on said base, piston rods of said hydraulic cylinders being pivotally mounted within bracket means secured fixedly to the underside of said panel, said vertical vanes upon said panel being arcuately movable thereupon by outward ends of said vertical vanes being secured to a horizontally slideable bar so that said outward ends of said vertical vanes are movable respective to a wind direction and wind to enter between said vertical vanes, and said plate being angularly disposed and overhanging an end of said panel in the outer peripheral area of said cylinder.

4,115,029
CENTRIFUGAL PUMP

Dusan Florjancic, Winterthur, Switzerland, and Heinz-Bernd Matthias, Frankenthal, Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 436,689, Jan. 25, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,017
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1973, 2303718
Int. Cl.[2] F01D 1/02
U.S. Cl. 415—211 10 Claims

1. In a centrifugal pump, particularly in a primary recirculating pump for use in pressurized-water and boiling-water reactors, a combination comprising a substantially spherical hollow pump housing having a circumferential wall provided with an inlet opening, a sealable opening substantially opposite said inlet opening and an outlet opening intermediate said sealable opening and said inlet opening and being at least close to the plane of the latter; an impeller rotatable in said housing inwardly adjacent said sealable opening and spaced from said inlet opening; and an inlet structure having an outer section which is rigid with said housing and inclined with respect to the axis of said impeller and which communicates with the said inlet opening at the outer side of said housing and a discrete inner section installed in said housing in communication with said inlet opening and extending from said wall towards said impeller to convey incoming fluid into the range of the same, said inner section comprising a plurality of separate tubular

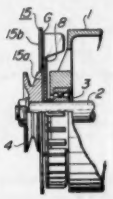


portions and having a flow passage which at least in part converges in direction towards said impeller, and said inner section and impeller being removable from said housing by way of said sealable opening.

4,115,030
ELECTRIC MOTOR OR GENERATOR INCLUDING CENTRIFUGAL COOLING FAN

Mitsuo Inagaki; Hideaki Sasaya, and Takashi Kurahashi, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 17, 1977, Ser. No. 769,782
Claims priority, application Japan, Feb. 20, 1976, 51-18228
Int. Cl.[2] F01D 5/00
U.S. Cl. 416—93 R 7 Claims



1. A rotary electric machine comprising:

a housing having end wall means formed therein with a plurality of air vents for providing communication between an interior and an exterior of said housing;

a rotary shaft rotatably supported by said housing;

a cooling fan securely fitted on said rotary shaft for rotation therewith;

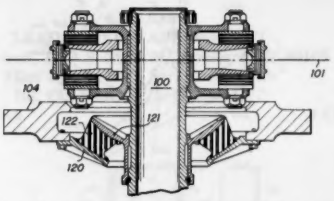
said cooling fan having on its periphery means providing a plurality of fan blades, notches between said fan blades, and a backing disc-plate having a portion covering said notches and fixed at the back side of said cooling fan for rotation therewith, with a clearance defined between said disc-plate and said cooling fan for preventing vibratory contact between said disc-plate and said cooling fan, said clearance being selected within the range in which turbulence air flows are not produced.

4,115,031

HUB SPRING MOMENT ISOLATION IN UNDERSLUNG TWO-BLADED TEETERING ROTOR

Jan M. Drees, Dallas; Walter G. O. Sonneborn, Fort Worth, and Jing G. Yen, Arlington, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 12, 1974, Ser. No. 460,353
Int. Cl.[2] B64C *11/12*
U.S. Cl. 416—134 A **9 Claims**



1. In a two-blade teetering rotor helicopter having control power in zero-g flight through a pylon having

a coupling connected to pivot on a teeter axis transverse to said pylon and to undersling said rotor a predetermined distance below said teeter axis

with a hub spring connected between said pylon and said rotor to resist flapping of said rotor about said teeter axis thereby to assure control power to said helicopter, the improvement comprising:

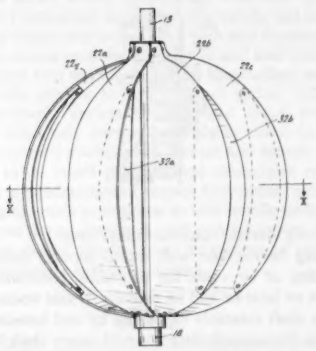
each said blade structured to have a cantilevered in-plane natural frequency when said blade is rotating at the normal r.p.m. of said rotor related to the amount of underslinging and the spring rate of said hub spring to isolate by dynamic absorption two cycles per revolution vibration produced in said pylon by moments due to said hub spring.

4,115,032

WINDMILL ROTOR

Heinz Lange, P.O. Box 1374, Merritt, Canada (V0K 3B0)

Filed Mar. 7, 1977, Ser. No. 775,181
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—227 A **12 Claims**



1. A windmill rotor comprising

(a) a vertically extending shaft;

(b) a plurality of at least three identical, plate-like, main blades arranged symmetrically around said shaft, each having a narrow upper end and a narrow lower end;

(c) means securing the upper ends of the blades to the shaft at a common upper location and means securing the lower ends of the blades to the shaft at a common lower location, each blade bowing outwardly between its ends whereby collectively the blades define a generally sphere-like chamber;

(d) each blade having a leading edge lying in a generally vertical plane and a convex trailing edge curving outwardly to define a central blade portion wider than said blade ends, at which central portions the trailing edges are spaced further from the shaft than the leading edges whereby each blade forms a scoop;

(e) the low end of each blade being sted to form a deflecting portion inclined upwardly from its trailing to its leading edge whereby to generate an upward movement of air within said chamber;

(f) a similar number of identical plate-like, secondary blades each smaller than and associated with a respective main blade and each having a narrow upper end, a narrow lower end and a wider central portion therebetween; and

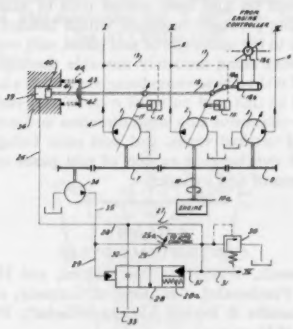
(g) means securing the upper and lower ends of the secondary blades to their respective main blades at similar upper and lower locations thereon with a trailing edge of each secondary blade projecting beyond the trailing edge of its associated main blade and with a gap between the central portion of each secondary blade and the central portion of its associated main blade.

4,115,033

CONTROL DEVICE FOR A HYDRAULIC SYSTEM HAVING AT LEAST TWO PUMPS

Gustav Kleineisel, Mainaschaff; Dietrich Kuchenbecker, Aschaffenburg, and Gerd Ahrens, Laufach, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 24, 1977, Ser. No. 762,173
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603563
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—216 **11 Claims**



1. A control device for a hydraulic system comprising at least one first pump having a variable output per revolution as determined by the position of a control member and connected to a first hydraulic network, at least one second pump having a predetermined output per revolution, an energy source having an output shaft connected to said pumps for driving same, and a setting piston shiftable in a respective cylinder and operatively connected to said member for varying the displacement per revolution of said first pump, said control device comprising, in combination:

a control line connecting the output side of said first pump with said cylinder;

a control-pressure pump connected to said shaft and having an output determined by the speed of said shaft;

a spring action on said member in a direction opposite to that at which pressure in said cylinder acts upon said member;

a control piston acting upon a seat of said spring for varying the degree to which said spring tends to allow displacement of said control member;

a control cylinder slidably receiving said piston;
a control valve responsive to the output of said control pressure pump; and
means for applying the output of said control pressure pump as controlled by said valve to said control cylinder.

4,115,034
VEHICLE-ACTUATED AIR COMPRESSOR AND SYSTEM THEREFOR

Roland L. Smith, 4600 U.S. Hwy. 19 North, Palm Harbor, Fla. 33563

Filed Jul. 11, 1977, Ser. No. 814,685
Int. Cl.[2] F04B *17/06, 35/06*
U.S. Cl. 417—231 **8 Claims**

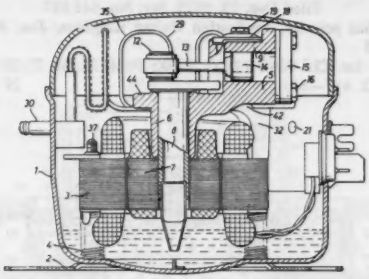
1. A vehicle-actuated air compressor comprising:
actuator means operatively arranged for actuation in response to motion of a vehicle;
a cylinder;
a piston having forward and reverse strokes in said cylinder and operatively coupled to said actuator means for movement in response to actuation of said actuator means by vehicle motion for compressing air in said cylinder;
first valve-controlled vent means for said cylinder communicating with one side of said piston for introducing air into said cylinder behind said piston during a forward stroke of said piston;
second valve-controlled vent means for said cylinder communicating with the other side of said piston for introducing air into said cylinder on the other side of said piston during a reverse stroke thereof;
first valve-controlled outlet means communicating with said other side of said piston for supplying air compressed by said piston during a forward stroke thereof to a utilization device;
and second valve-controlled outlet means communicating with said one side of said piston for supplying air compressed by said piston during a reverse stroke thereof to said utilization device;
said actuator means comprising:
a body with a first slot therein extending longitudinally of the direction of vehicle motion;
a lever slidable along said slot and projecting beyond said body for actuation by the vehicle to cause the lever to slide along said slot;
and a flexible cable operatively connected between said lever and said piston to cause movement of said piston in response to movement of said lever;
said slot having an offset at each end extending transverse to its length to permit movement of the lever out of the way of the vehicle as the latter moves past the air compressor.

4,115,035
MOTOR COMPRESSOR

Hans Jürgen Tankred, Sonderborg, and Per Johan Madsen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 11, 1977, Ser. No. 786,508
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617370
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—312 **7 Claims**

1. A motor compressor assembly for refrigerators, comprising a casing, a motor including a rotor and a stator resiliently mounted in said casing for rotation about a vertical axis, said stator including a stack of laminations, a vertically extending motor shaft having a crank at the upper end thereof spaced from said rotor, a bearing member for said shaft disposed between said crank and said rotor, a beam member attached to and extending laterally from said bearing member, a cylinder member at the radially outer end of said beam member, a piston for said cylinder member, a connecting rod connecting said

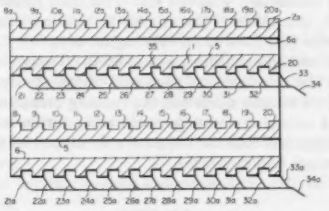


piston to said crank, support means extending downwardly from said radially outer end of said beam member and engaging the top of said stack of laminations, and fastening means for attaching said support means to said laminations.

4,115,036
PUMP FOR PUMPING LIQUID IN A PULSE-FREE FLOW

David Paterson, Copthorne, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 765,936
Claims priority, application United Kingdom, Mar. 1, 1976, 8049/76
Int. Cl.[2] F04B *17/04, 43/12*
U.S. Cl. 417—322 **20 Claims**



1. A substantially pulse free, cylindrical pump which operates in a peristaltic manner on a cylinder to give a continuous flow of relatively small quantities of a liquid from an inlet port to an outlet port of the pump, which pump comprises two concentric cylinders in which at least one cylinder is formed from a piezoelectric ceramic material polarized in the radial direction and divided in the axial direction into at least three piezoelectric elements, each of which elements include at least one circumferential ring, separated by circumferential grooves on the surface of the cylinder remote from an annular space between the two cylinders; an electrical power supply in separate electrical contact with each ring and a switching device which completes an electrical circuit between the electrical power supply and each ring; wherein each element in seccession when energized electrically expands, radially in progressive sequence to fill the adjacent part of the annular space between the two cylinders and forms a moving seal which moves progressively from the inlet port of the outlet port to expel a first quantity of liquid therefrom.

4,115,037
OPPOSED PISTON INTERNAL COMBUSTION ENGINE-DRIVEN PUMP

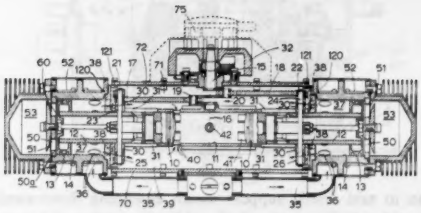
Stanley Milton Butler, Hassocks, England, assignor to Direct Power Limited, London, England

Filed Dec. 23, 1975, Ser. No. 643,857

Claims priority, application United Kingdom, Jan. 3, 1975, 193/75

Int. Cl.[2] **F04B** *17/00, 35/00;* **F02B** *25/08, 75/28*

U.S. Cl. 417—341 **19 Claims**



1. A hand-portable power unit comprising:

(a) an internal combustion engine, and

(b) first and second engine power utilization devices,

(c) said engine including a common engine cylinder and first and second opposed engine pistons arranged to reciprocate in opposition in said common engine cylinder,

(d) said first and second engine power utilization devices being of substantially similar power absorbing characteristics to one another and each having a driven member,

(e) first connecting means substantially rigidly connecting each said driven member to a respective one of said first and second opposed engine pistons so that said driven members reciprocate rectilinearly in a cycle of movement,

(f) a crankshaft having first and second throws,

(g) means mounting said crankshaft for rotation about an axis extending perpendicular to the engine cylinder axis, and

(h) second connecting means substantially directly connecting each piston/device pair to a respective said throw of said crankshaft, whereby said crankshaft rotates once for each said cycle of movement to convert reciprocating motion into continuous rotating motion,

(i) said second connecting means being effective to synchronize the movement of each said piston/device pair with respect to each other and the rotating crankshaft,

(j) said second connecting means being further effective to transmit less than the full power developed by said engine to rotate said crankshaft.

4,115,038
MOTOR DRIVEN PUMP

David P. Litzenberg, 1528 Bryant La., Meadowbrook, Pa. 19046

Continuation-in-part of Ser. No. 541,491, Jan. 27, 1975, Pat. No. 3,967,915. This application Oct. 12, 1976, Ser. No. 731,302

Int. Cl.[2] **F04B** *17/00*

U.S. Cl. 417—357 **13 Claims**

1. In combination

a rigid post member comprising a disc,

an impeller housing mounted on said post member on one side thereof and positioned thereby and having a fluid inlet connection and a fluid delivery connection communicating with the interior thereof,

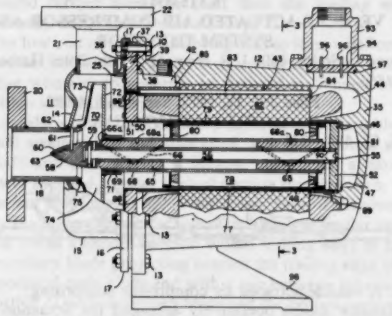
a unitary motor housing mounted on and positioned at one end thereof by said post member on the other side thereof and having a bore at the other end positioned by the mounting of said housing on said post member,

said motor housing having a motor stator winding therein mounted on and positioned by said post member,

said post member having a motor stator isolating sleeve positioned thereby and extending therefrom and into said bore in said motor housing interiorly of said motor stator and having an end closure,

a mandrel fixedly carried at one end in said end closure and at the other end in said impeller housing,

a shaft rotatably carried on said mandrel,



a motor rotor carried on said shaft interiorly of said motor stator winding and of said sleeve, and

a pump impeller in said impeller housing and connected to said shaft in driven relation.

4,115,039
RESILIENT PRESSURE TUBE

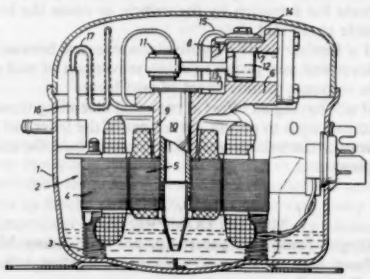
Ole Mikel Schjelde, and Ebbe Larsen, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 11, 1977, Ser. No. 786,423

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617387

Int. Cl.[2] **F14B** *39/12;* **F16F** *15/02*

U.S. Cl. 417—363 **4 Claims**



1. Refrigeration apparatus comprising a housing having a refrigerant outlet port, a motor and a compressor forming a unit, said unit being resiliently mounted in said housing with the axis of said motor being vertically disposed, a resilient pressure tube extending from said compressor to said outlet port, said tube having at least two adjacent convolutions in intersecting planes which are generally vertically disposed at substantially right angles to each other, said convolutions being substantially rectangular with mostly rectilinear tube sections.

4,115,040
PERMANENT MAGNET TYPE PUMP

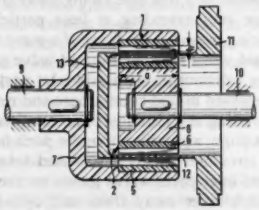
Manfred Knorr, Bochum-Wattenscheid, Germany, assignor to Franz Klaus-Union, Germany

Filed May 25, 1977, Ser. No. 800,219

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2624058

Int. Cl.² F04B *17/00*

U.S. Cl. 417—420 **8 Claims**



1. A light-weight permanent magnet type pump having a pump impeller shaft and a permanent magnet drive means therefor, said drive means comprising an interior rotor fixed to the pump impeller shaft, an exterior rotor mounted for rotation closely adjacent the interior rotor with an air gap therebetween, said interior rotor being adapted to receive a drive torque of at least 1 m·kg transmitted in synchronism by said exterior rotor, said pump impeller shaft and said interior rotor being housed and supported in a single sealed chamber, a partition of non-magnetizable material extending through said air gap and closing said chamber, a closed ring on each of the opposed surfaces of said interior and exterior rotors, each of said closed rings being formed by the same even number of permanent magnets of alternating polarity and embedded in a non-magnetizable material in side-by-side contiguous array, each of said magnets being a relatively thin magnetic plate formed of a magnetic material containing alloys of cobalt and rare earths and magnetized in the direction of the thickness of said air gap, said magnets each having a magnet length, extending in the direction of thickness of said air gap, which is somewhat larger than the air gap thickness, each of said magnets having a magnet width, extending in the direction of rotation, which is larger than said magnet length.

4,115,041
PUMPS

Peter Richard Selwood, deceased, late of Southampton, England; by Timothy John Selwood, executor, Minstead, Near Cadnam, England; by Martin John Shelley Axtell, executor, Lymington, England, and John David Burton, St. Mary Bourne, Near Andover, England, assignors to William R. Selwood Limited, Eastleigh, England

Filed Apr. 14, 1976, Ser. No. 676,882

Claims priority, application United Kingdom, Apr. 15, 1975, 15366/75

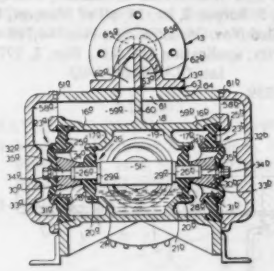
Int. Cl.² F04B *23/10, 43/08*

U.S. Cl. 417—440 **11 Claims**

1. A pump comprising a body having at least one pumping chamber communicating at opposite ends respectively with a pump inlet and a pump outlet, an actuator in the pumping chamber reciprocable longitudinally thereof by drive means and having a relatively rigid main central portion and a peripherally extending elastic sealing ring retained in a clearance space and in non-sliding fluid-tight engagement between said central portion and a lateral wall of said pumping chamber, valve means controlling the flow of fluid through said pumping chamber from said inlet to said outlet, and fluid inductance means and fluid capacitance means operative between said pump inlet and outlet for controlling the operational characteristic of the pump, the latter including the improvement wherein:

a. said valve means controlling flow of fluid through said pumping chamber is mounted exclusively on said actuator,

b. said body defines a flow path from said inlet to said outlet of a configuration to afford flow in a pressure relief mode internally of said body cyclically from and to said pumping chamber when delivery from said outlet is shut off,



c. said fluid capacitance means comprises fluid capacitance means operative throughout the pumping cycle and in continuous communication with said pumping chamber downstream of said actuator.

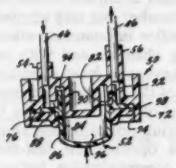
4,115,042
SINGLE FLOW DIRECTION MINIATURE PUMP

Robert Frederich Schroeder, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 21, 1977, Ser. No. 761,122

Int. Cl.² F04B *43/00, 21/02*

U.S. Cl. 417—479 **4 Claims**



1. In a pump, the combination comprising:

a body member having a circular recess formed therein;

an annular groove formed in the surface of said recess;

an arcuate groove formed in the surface of said recess, said arcuate groove being spaced radially outwardly from and coaxial with said annular groove;

an inlet aperture in fluid communication with said annular groove;

an outlet aperture in fluid communication with said arcuate groove;

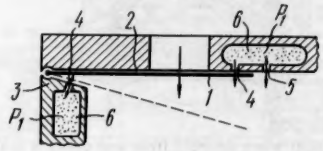
fluid passage means interconnecting said annular groove and said arcuate groove;

a flexible diaphragm member having a flange portion configured for securing within said recess and having a deformable dome-shaped portion extending outwardly therefrom to form a fluid receiving chamber, said diaphragm member having an integral skirt portion extending into said annular groove in spaced relation with the surface thereof, said skirt portion having a cutaway portion adjacent said fluid passage means, said diaphragm member also having an integral arcuately configured tongue portion extending into said arcuate groove in normally sealing relation with said fluid passage means, said tongue portion being displaced outwardly upon depression of said dome-shaped portion to pass fluid from within said chamber through said fluid passage means and through said outlet aperture, said skirt portion being configured for sealing said inlet aperture from fluid communication with said chamber only upon depression of said dome-shaped portion, said skirt portion and said tongue portion acting as check valves during operation of said pump.

4,115,043
SUCTION VALVE OF THE PISTON COMPRESSOR

Alexandr Vasilievich Bykov, ulitsa Vavilova, 52, korpus 4, kv. 324; Igor Martynovich Kalnin, ulitsa Kropotkinskaya, 26, kv. 13; Vsevolod Sergeevich Scherbakov, ulitsa Vvedenskogo, 24, kv. 120, and Igor Andreevich Gruzintsev, Malaya Schukinskaya ulitsa, 5, korpus 2, kv. 14, all of Moscow, U.S.S.R.

Filed Nov. 24, 1976, Ser. No. 744,760
Claims priority, application U.S.S.R., Dec. 2, 1975, 2195813
Int. Cl.[2] F04B *21/02*
U.S. Cl. 417—559 6 Claims

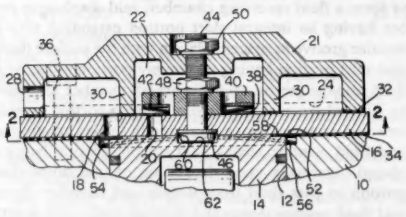


1. A suction valve for use in a piston compressor for compressing a gaseous fluid comprising, a valve body member defining at least one mean pressure accumulating chamber disposed in use in communication with the interior of a compressor cylinder thereby to be in communication with the effect of suction and pressure strokes of a piston in the compressor cylinder, said valve body member defining at least one admission chamber separate from the mean pressure accumulating chamber and communicable in use with a gaseous fluid to be compressed in said cylinder, said body valve member defining a space defined between said mean pressure accumulating chamber and said admission chamber, said mean pressure accumulating chamber and said admission chamber each having a metering orifice in communication with the interior of the corresponding chamber and with said space, a valve plate in said space having at least a portion freely movable under control solely of the gaseous fluid pressure in said accumulating chamber and of itself for moving from a seated position closing the metering orifice to said admission chamber to an unseated position opening the last-mentioned metering orifice to establish communication between the admission chamber and said mean pressure accumulating chamber through said space, means defining a seat in said valve body member on which said valve plate is seated in said space and means for defining a stop in said valve body member for stopping and limiting the movement of said valve plate in opening the metering orifice to said admission chamber.

4,115,044
VALVE ARRANGEMENT FOR COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 4, 1976, Ser. No. 729,374
Int. Cl.[2] F04B *39/10*
U.S. Cl. 417—564 3 Claims

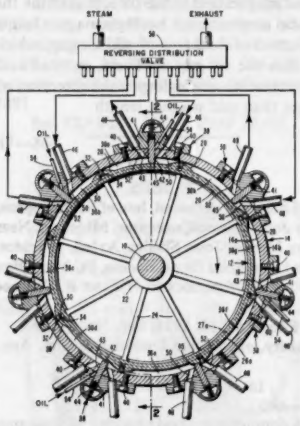


1. A compressor comprising: a cylinder block having a cylinder bore therein, a valve plate having one side the major portion of which is a substantially flat planar surface, said valve plate one side overlying said block and closing one end of said cylinder bore, said block being counterbored concentrically with said cylinder bore at the closed end thereof, a piston reciprocably received in said cylinder bore, inlet ports in said valve plate distributed in a circumferential ring about the axis of said cylinder bore, said inlet ports at least partially overlying said counterbore, valve means for controlling said inlet ports comprising a valve ring having a first side overlying said valve plate and said inlet ports from within said cylinder bore and a second side opposite said first side facing away from said inlet ports, said valve ring extending at least partially into said counterbore, spring means in the form of a wave washer resiliently biasing said valve ring against said valve plate flat surface into closing relationship with said inlet ports, said wave washer being received in said counterbore and resiliently contacting said valve ring at a plurality of points directly opposite said ring of inlet ports, a plurality of outlet ports formed in said valve plate in circumferentially distributed relation radially inward from said inlet ports, valve means on the side of said valve plate which faces away from said cylinder bore for controlling said outlet ports, a head mounted on the side of said valve plate which faces away from said cylinder bore and having first channel means communicating with said inlet ports and second channel means communicating with said outlet ports and rib means between and supporting said channel means, gasket means between said head and said valve plate, a bolt connecting said head to said cylinder block, and bolt means disposed substantially coaxially with said cylinder bore for rigidly connecting said head and said valve plate.

4,115,045
ROTARY MOTOR

James C. Wyman, 2002 Westridge Rd., Carlsbad, N. Mex. 88220

Continuation of Ser. No. 419,284, Nov. 27, 1973, abandoned.
This application Apr. 26, 1977, Ser. No. 790,859
Int. Cl.[2] F01C *1/00, 19/04, 21/04*
U.S. Cl. 418—97 2 Claims



1. A rotary engine capable of being driven by a fluid such as steam and the like comprising a peripheral cylindrical casing, a rotor having a circular peripheral rim spaced from the inner periphery of said casing and adapted to rotate within said casing, and a pair of side walls disposed between said casing and said rim thereby defining an annular enclosed space:

a. said rotor comprising on the outer periphery of said rim a plurality of equally spaced transverse lobes, each lobe containing a transverse slot at its peak and transverse spring-biased seal means disposed within said slot adapted to engage the inner periphery of said casing, said lobe, slot and seal means extending between and to said side walls;

b. a plurality of equally spaced, vane guide members disposed on the outer periphery of said casing, each guide member containing a transverse slot aligned with a transverse slot in said casing, a spring-biased transverse vane means comprising rounded convex ends disposed within said guide member transverse slot means and said casing transverse slot means, said vane means convex ends adapted to engage the outer periphery of said rim and said lobes, said vane means and slot means extending between and to said side walls;

c. each of said vane guide members comprising a fluid inlet and a fluid exhaust means adapted to be aligned with respective inlet and exhaust port means in said casing, said inlet port means adapted to be disposed on one side and said exhaust port means disposed on the other side and in close proximity to said casing slot means;

d. said fluid inlet and fluid exhaust means communicating with manifold means for introducing live fluid and exhausting exhausted fluid;

e. said rotor containing at least eight total number of lobes and said casing containing one less total number of vanes than the total number of lobes;

f. said rim comprising peripheral transverse flange means extending on each said from the outer peripheral surface of said rim and adapted to fit and turn within respective circumferential grooves contained in said side walls;

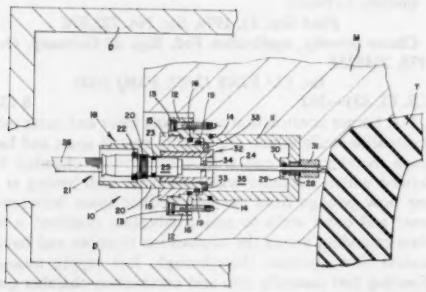
g. oil inlet means disposed through said vane guide members communicating with one side of said vane and said casing slot means; whereby adjacent lobes and respective seals, the inner periphery of said casing, and the outer periphery of said rim define the same number of individual chambers in said annular enclosed space as there are number of lobes, wherein during rotation of said rotor each chamber is adapted to communicate with succeeding vane means and respective fluid inlet and exhaust port means; and wherein expansion of continuously introduced live fluid into said chambers from said inlet ports against said vane means imparts rotary motion to said rotor, and simultaneously exhausted fluid is continuously removed from said chambers through said exhaust ports by the sweeping action of said vane means, and wherein during rotation the maximum amount of force obtained by expansion of introduced fluid in each successive chamber is progressively staggered to impart uniform rotary motion to said rotor.

4,115,046

PROBE INJECTION SYSTEM FOR A TIRE CURING PROCESS

Thomas W. Smith, Fort Myers Beach, Fla., and Jeffrey N. Bibbee, Mogadore, Ohio, assignors to McNeil Corporation, Akron, Ohio

Filed Sep. 22, 1977, Ser. No. 835,646
Int. Cl.[2] B29H *5/02*
U.S. Cl. 425—29 **11 Claims**



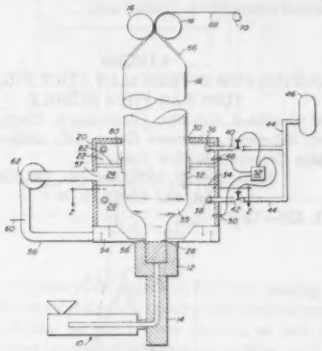
1. Apparatus for injecting a temperature sensitive probe into the rubber compound of a tire to be vulcanized in a mold, the mold being heated at least in part by pressurized steam in a cavity adjacent the mold comprising, a housing mounted in the mold, a probe assembly including the temperature sensitive probe, movable means in the housing and carrying said probe assembly, and an enclosed chamber within said housing to receive fluid under pressure therein acting on said movable means to maintain the probe out of the tire, said movable means communicating with the cavity so that steam introduced into the cavity acts on said movable means to extend the probe into the tire.

4,115,047

APPARATUS FOR QUENCHING BLOWN FILMS

Joseph J. Stelmack, 22 Elmwood Ter., Wayne, N.J. 07470

Filed Sep. 7, 1976, Ser. No. 720,929
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—72 R **2 Claims**



1. An improved apparatus for quenching blown films produced by an extruder through an orifice of a die attached thereto by an adapter such that a heat plastified polymeric film enters into a cooling chamber housing, wherein the improvement comprises;

said cooling chamber housing being a substantially cylindrical structure with an opening at the top to permit the passage of quench blown films therethrough;

said cooling chamber housing being secured at its base to said extruder immediately above the orifice of said die;

a cryogenic flash chamber defined by said cooling chamber housing and having two zones, an upper cryogenic flash chamber and a lower cryogenic flash chamber;

a first spray manifold located at a point near the middle of said cryogenic flash chamber and in the lower zone thereof but above the frost line for spraying a cryogenic coolant fluid into said cryogenic flash chamber so that the fluid vaporizes to cool such a film passing through the cryogenic flash chamber such that said film is sprayed after it has already started to solidify;

means to recirculate said vapors of said cryogenic coolant comprising:

an outlet near the top of said cryogenic flash chamber;

an air ring encircling the base of said cooling chamber housing;

piping from said outlet to said air ring near the orifice of said die;

a blower and adjustable baffles within said piping to draw an even, controlled flow of coolant vapors from said upper cryogenic flash chamber through said air ring onto molten polymer exiting from said die;

means to control the temperature of the vapor in said cryogenic flash chamber comprising:

a thermocouple through said housing;

a temperature control device connected to said thermocouple;

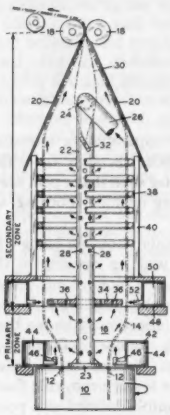
a flow control valve in said piping between said first spray manifold and said cryogenic fluid supply means;
said flow control valve being controlled by said temperature control unit;
a supply tank and piping means operatively associated with said spray manifold to supply cryogenic coolant fluid to said spray first manifold;
a second spray manifold located in said upper cryogenic flash chamber;
a piping connecting said second spray manifold to said cryogenic fluid supply means;
a second thermocouple through said housing;
a second temperature control device connected to said thermocouple;
a second flow control valve in said piping between said second spray manifold and said cryogenic fluid supply means;
said second flow control valve being controlled by said second temperature control unit.

4,115,048

APPARATUS FOR INTERNALLY COOLING A PLASTIC TUBULAR FILM BUBBLE

Richard Bernhard Alderfer, Glastonbury, Conn., and Gerald Harry Scheibner, Downers Grove, Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,529
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—72 R **37 Claims**



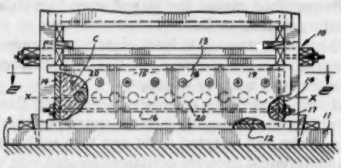
1. An apparatus for manufacturing film from thermoplastic resinous film forming materials which comprises in cooperating combination:
(a) a tube die adapted to extrude a film tube;
(b) flattening means positioned a distance from the die for flattening the extruded tube;
(c) a diffuser disposed on the discharge side of the die in the space enveloped by the extruded film tube, said diffuser having a gaseous coolant inlet disposed in the inlet portion of the diffuser, and said diffuser further having means to deliver from its peripheral surface a gaseous coolant to the interior surface of the extruded film tube;
(d) film slitting means disposed between said inlet portion of said diffuser and said tube die for continuously slitting the extruded film to provide at least one slitted opening in the extruded film;
(e) restrictor means associated with the diffuser defining a primary zone and a secondary zone of the extruded film and being adapted to maintain a pressure differential between the primary and secondary zone; and
(f) means operatively associated with said gaseous coolant inlet for communicating gaseous coolant through the slitted opening to the gaseous coolant inlet whereby gaseous coolant introduced to the diffuser through the gaseous coolant inlet continuously passes through the diffuser into the primary and secondary zones and into contact with the interior surface of the tube and is continuously withdrawn through said slitted opening.

4,115,049

MEANS FOR FORMING AND SPLITTING PRESTRESSED CONCRETE ELEMENTS

Donald G. Grubb, 7129 17th Ave. South, Minneapolis, Minn. 55423

Filed Jun. 2, 1977, Ser. No. 802,777
Int. Cl.[2] B28B *23/04*
U.S. Cl. 425—111 **2 Claims**



1. In a form for making concrete building panels,
(a) a flat generally rectangular bottom wall,
(b) two upright opposing pairs of side walls with one side wall extending along each side of the bottom wall,
(c) a top wall lying on a plane parallel to the bottom wall and connecting the upper edges of the side walls to form a boxlike enclosed form for holding concrete,
(d) a plurality of elongated insert members extending between one pair of side walls and spaced in parallelism along a common plane midway between the top and bottom walls and extending transversely from adjacent one to adjacent the other of the other pair of side walls,
(e) a first set of prestressed rods extending between one pair of side walls intermediate the insert members and the bottom wall,
(f) a second set of prestressed rods extending between the other pair of side walls intermediate the insert members and the top wall,
(g) each of said sets of rods lying in planes parallel to said common plane, and
(h) said first and second sets of rods extending perpendicular to each other.

4,115,050

BURNER CONSTRUCTION AND METHOD FOR BURNING LIQUID AND/OR GASEOUS FUEL

Reinhard Gerwin, Stuttgart, Germany, assignor to J. Eberspacher, Germany

Filed Sep. 13, 1976, Ser. No. 722,576
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2545234
Int. Cl.[2] F23D *15/02*; F23Q *3/00*
U.S. Cl. 431—352 **8 Claims**

1. A burner construction comprising inner and outer tubular combustion walls which are radially spaced apart and have a space therebetween and with a combustion chamber being defined within the inner wall, said inner wall having at least one flow passage from the intermediate space between said inner and outer walls to said combustion chamber, a baffle plate extending across the combustion chamber and having a central flow aperture therethrough, fuel supply means for directing fuel centrally into said combustion chamber on one side of said baffle plate to direct the fuel through the opening of said baffle plate, first fuel air supply means for directing combustion air into said combustion chamber around said fuel supply means and against said baffle plate and through the

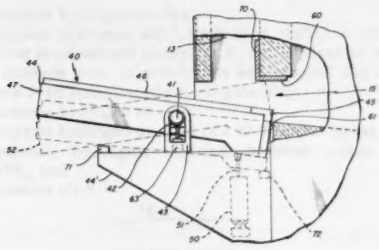
aperture, and second combustion air supply means for directing air through the space between the walls in a concentrated stream radially inwardly into the combustion chamber downstream of the baffle plate, said second air supply means including a plurality of tubular socket members formed in said inner wall at spaced circumferential locations therearound and terminating at an inwardly directed nozzle, said baffle plate having a plurality of radially extending slots disposed around the aperture thereof equal to the number of said nozzles.

4,115,051

RADIATION REFLECTING DOOR FOR PROCESS FURNACE

John W. Bjerklie, Cape Elizabeth, Me., assignor to Hague International, So. Portland, Me.

Filed Nov. 29, 1976, Ser. No. 745,803
Int. Cl.[2] F27D *1/18;* F23M *7/00*
U.S. Cl. 432—3 **8 Claims**



8. A method of opening and closing a horizontal slot of a metal processing slot furnace by,

mounting a door in a substantially horizontal plane about a pivotal axis parallel to an elongated axis of said slot,

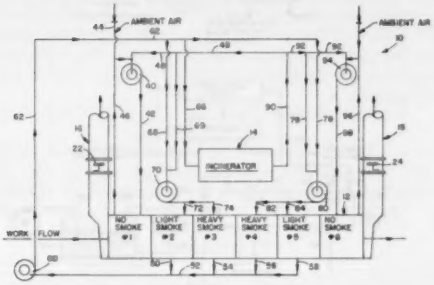
pivoting said door through angles of from $\pm 9\text{-}\frac{1}{2}°$ from a horizontal plane to open and close said door and using a portion of said door as a work holding platform when said door is opened and when it is closed, with another portion of said door acting to open or close said slot as may be desired.

4,115,052

WEB STOCK TREATING OVEN

Charles S. Flynn, Muskegon, Mich., assignor to Blu-Surf, Inc., Muskegon, Mich.

Filed Jun. 30, 1977, Ser. No. 811,584
Int. Cl.[2] F23J *5/04*
U.S. Cl. 432—72 **8 Claims**



1. A multiple section oven apparatus for heat treating web stock to drive off volatilizable and combustible residual materials thereon, including an entry oven section, an exit oven section, and at least one intermediate oven section, with said sections forming an oven chamber;

means for conveyance of web stock through said oven by passage into and through said entry oven section, through said intermediate oven sections, and through and out said exit oven section;

incineration burner means outside said oven chamber;

discharge duct means from said intermediate oven sections and gas propelling means for withdrawing laden gases from said intermediate oven sections through said discharge duct means; said discharge duct means having parallel flow branches for flow of one gaseous portion to said incineration burner means and flow of another gaseous portion back to said intermediate sections;

ducting flow means from said incineration burner means to at least one of said entry oven and exit oven sections for conducting hot combustion gases to such whereby gases in said oven tend to flow toward said intermediate sections for continuous recirculation and combustion.

4,115,053
DRY HEAT PROCESS FOR DYEING AND PRINTING ORGANIC MATERIAL

Peter Aeschlimann, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

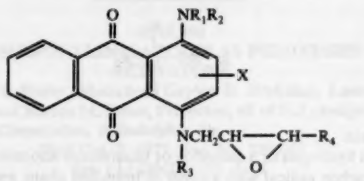
Filed Sep. 9, 1976, Ser. No. 722,003

Claims priority, application Switzerland, Sep. 15, 1975, 11934/75; Sep. 15, 1975, 11935/75

Int. Cl.[2] D06P *5/00*; C09D *11/00*

U.S. Cl. 8—2.5 A **13 Claims**

1. In a dry heat process for the dyeing or printing of organic textile material selected from the group consisting of polyvinyl chloride, polyamides, polyurethanes, polyesters, polymers and copolymers of acrylonitrile, and polymers and copolymers of dicyanoethylene which comprises bringing the textile material to be dyed or printed into contact with a treated transfer carrier bearing on at least a portion of at least one surface thereof at least one heat transferable organic disperse dyestuff, heating the said carrier while in contact with the said textile material at a temperature and for a time period sufficient to effect transfer of dyestuff from the carrier to the textile material, and separating the dyed or printed textile material from the carrier, the improvement wherein the transfer carrier carries at least one reactive disperse dyestuff of the formula



wherein

R_1 represents hydrogen or alkyl,

R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or substituted or unsubstituted phenyl, or R_1 and R_2 together with the nitrogen atom to which they are attached can also form a 5- to 7-membered heterocyclic ring,

R_3 represents hydrogen or alkyl,

R_4 represents hydrogen or alkyl of 1 to 2 carbon atoms,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

R_5 represents alkyl.

4,115,054
PROCESS FOR THE RAPID, CONTINUOUS AND WATERLESS DYEING AND TEXTURIZING AND HEAT-SETTING TEXTILE AND PLASTIC MATERIALS

Julius Hermes, Martinsville, Va., assignor to Martin Processing, Inc., Martinsville, Va.

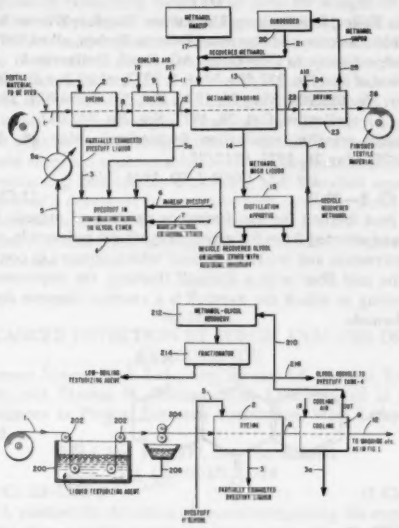
Continuation-in-part of Ser. No. 647,775, Jan. 9, 1976, Pat. No. 4,047,889. This application Dec. 15, 1976, Ser. No. 750,910

The portion of the term of this patent subsequent to Sep. 13, 1994 has been disclaimed

Int. Cl.[2] C09B *67/00*; D02G *1/00*; D06P *1/64*

U.S. Cl. 8—17 **22 Claims**

1. A process for texturizing and heat-setting textile material containing a low boiling texturizing agent in liquid phase in an amount sufficient to cause flashing of the low boiling texturizing agent upon contact of the thus-treated textile material with a high boiling organic liquid at a relatively high temperature, comprising contacting textile material impregnated with the low boiling liquid texturizing agent with the high boiling organic liquid at a high temperature thus texturizing and heat-setting the textile material, cooling the texturized textile material and washing same with a low boiling organic liquid which is free or substantially free of water, followed by drying the texturized textile material, the washing and drying steps being carried out in an essentially closed system, with the separation and recovery of the low boiling organic wash liquid, low boiling organic wash liquid thus recovered being recycled to the washing step and with the low boiling organic wash liquid vaporized from the textile material during the drying step being recovered, and with the low boiling texturizing agent



that is evaporated during the texturizing and heat-setting being removed from the high temperature textile material contacting zone as a mixture thereof with vapor of the high boiling organic liquid.

4,115,055
MIXTURE OF WATER-INSOLUBLE MONOAZO DYESTUFFS FOR COLORING TEXTILE MATERIALS CONSISTING AT LEAST PARTLY OF LINEAR, AROMATIC POLYESTERS

Hans Dieter Kirner, Pratteln; Albert Bitterlin, Birsfelden, and Ekkehard Walter Müller, Pratteln, all of Switzerland, assignors to Rohner AG Pratteln, Pratteln, Switzerland

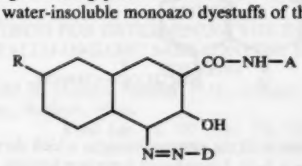
Filed Mar. 25, 1976, Ser. No. 670,548

Claims priority, application Switzerland, Mar. 26, 1975, 3901/75

Int. Cl.[2] C09B *27/00*

U.S. Cl. 8—26 **17 Claims**

1. A composition for coloring textile materials consisting at least partly of linear, aromatic polyesters, comprising a mixture having a melting point below 200° C and containing at least two water-insoluble monoazo dyestuffs of the formula



(I)

wherein

R is hydrogen, halogen or an alkoxy group,

A is an aromatic radical substituted with 0 to 1 halogen and 0 to 2 alkyl and alkoxy groups, and

D is the residue of a diazonium compound of the benzene series free from sulphonic acid and carboxyl groups which may be substituted with halogen and one or more alkyl, alkoxy, alkoxyalkyl, acyloxy and alkoxycarbonyl groups.

4,115,056

METHODS FOR DYEING OR PRINTING USING AMINO-ANTHRAQUINONE REACTIVE DISPERSE DYES

Stefan Koller, Ramlinsburg; Urs Karlen, Magden; Werner Kneubühler, Bukten, and Raymond Défago, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

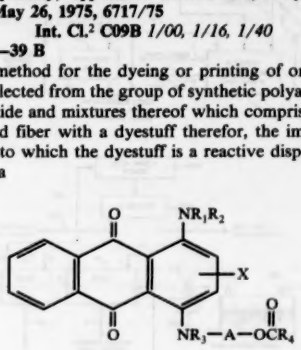
Division of Ser. No. 773,403, Mar. 1, 1977, which is a division of Ser. No. 689,985, May 26, 1976, Pat. No. 4,044,029. This application Oct. 28, 1977, Ser. No. 847,062

Claims priority, application Switzerland, May 26, 1975, 6716/75; May 26, 1975, 6717/75

Int. Cl.[2] C09B *1/00, 1/16, 1/40*

U.S. Cl. 8—39 B **12 Claims**

1. In a method for the dyeing or printing of organic fiber material selected from the group of synthetic polyamide, natural polyamide and mixtures thereof which comprises contacting the said fiber with a dyestuff therefor, the improvement according to which the dyestuff is a reactive disperse dye of the formula



wherein

R_1 and R_2 together with the nitrogen atom to which they are attached form a 5- to 7-membered heterocyclic ring

R_3 represents hydrogen or alkyl,

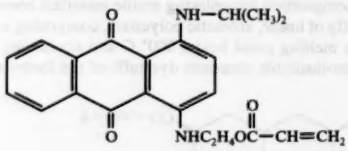
R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen,

A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

R_5 represents alkyl.

2. In a dry heat transfer dyeing or printing process which comprises bringing an organic fiber material selected from the group of synthetic polyamide, natural polyamide and mixtures thereof into contact with the treated face of a carrier sheet containing at least one sublimable dyestuff, subjecting the material and carrier while in contact to a heat treatment to effect dyestuff transfer, and separating the material from the carrier sheet, the improvement according to which at least one sublimable dyestuff is a reactive disperse dye of the formula



wherein

R_1 and R_2 together with the nitrogen atom to which they are attached form a 5- to 7-membered heterocyclic ring,

R_3 represents hydrogen or alkyl,

R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen,

A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

R_5 represents alkyl.

4,115,057

PROCESS FOR THE DYEING OF FIBROUS MATERIALS CONTAINING BASIC FUNCTIONS IN DYEING BATHS BASED ON ORGANIC SOLVENTS

Francesco DeFeo; Vincenzo Gemini, both of Milan, and Luigi Floridia, Florence, all of Italy, assignors to Montedison S.p.A., Milan, Italy

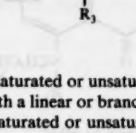
Filed Oct. 28, 1976, Ser. No. 736,511

Claims priority, application Italy, Oct. 30, 1975, 28832 A/75

Int. Cl.[2] D06P *3/06, 3/24, 1/39, 5/00*

U.S. Cl. 8—54 **6 Claims**

1. A process for the dyeing of fibrous materials having basic functions which comprises dyeing said fibrous materials in a dye bath comprising an organic solvent, an acid dye, water, and emulsifying substance, an organic acid and an aliphatic amine having the general formula:



wherein:

R is hydrogen or a saturated or unsaturated aliphatic hydrocarbon radical with a linear or branched chain; and where

R_1, R_2, and R_3 are saturated or unsaturated aliphatic hydrocarbon radicals with either a linear or branched chain, and the sum of the carbon atoms of radicals R, R_1, R_2, and R_3 is a whole number in the range from 11 to 29.

4,115,058

AROMATIC SULFONIC ANHYDRIDES AS PEROXYGEN ACTIVATORS

John H. Blumbergs, Highland Park; Joseph H. Finley, Metuchen, and Burton M. Baum, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,849

Int. Cl.[2] D06L *3/02, 3/04*

U.S. Cl. 8—111 **15 Claims**

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an aromatic sulfonic anhydride having the formula:

$$RSO_2—O—SO_2R$$

wherein each R is an aromatic ring system selected from the class consisting of a phenyl group, taken together an o-phenylene group, a naphthyl group, taken together an o-naphthylene group and a heterocyclic group having 1 ring or 2 fused rings, said ring or rings containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the class consisting of nitrogen, oxygen and sulfur, said groups optionally bearing 1 to 3 substituents selected from the class consisting of nitro, alkyl of 1 to 16 carbon atoms, alkoxy of 1 to 16 carbon atoms, aliphatic carboxamido of 1 to 16 carbon atoms, benzamido, chlorine and bromine.

4,115,059

AROMATIC SULFONYL FLUORIDES AS PEROXYGEN ACTIVATORS

John H. Blumbergs, Highland Park, and Fred R. Scholer, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 839,066
Int. Cl.[2] D06L *3/02, 3/04*
U.S. Cl. 8—111 14 Claims

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an aromatic sulfonyl fluoride of the formula $ArSO_2F$ wherein Ar is an aromatic ring system selected from the class consisting of a phenyl group, a naphthyl group, and a heterocyclic group having 1 to 2 rings, each containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the class consisting of nitrogen, oxygen and sulfur, said groups optionally bearing substituents selected from the class consisting of nitro, alkyl of 1 to 16 carbon atoms, alkoxy of 1 to 16 carbon atoms, aliphatic carboxamido of 1 to 16 carbon atoms, aliphatic acyl of 1 to 16 carbon atoms, benzamido, benzoyl, chlorine and bromine.

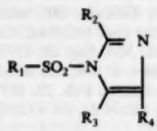
4,115,060

N-SULFONYLIMIDAZOLES AS PEROXYGEN ACTIVATORS

Joseph H. Finley, Metuchen; Gaylen R. Brubaker, Lawrenceville, and Burton M. Baum, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 839,067
Int. Cl.[2] D06L *3/02, 3/04*
U.S. Cl. 8—111 15 Claims

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an N-sulfonylimidazole having the formula:



wherein R_2, R_3 and R_4 are each selected from the class consisting of hydrogen, halogen, alkoxy of 1 to 16 carbon atoms, carbonylmethoxy, nitro, an aliphatic hydrocarbon radical of 1 to 16 carbon atoms, a cycloaliphatic hydrocarbon radical of 3 to 7 carbon atoms, an aromatic hydrocarbon radical of the benzene and naphthalene series and a heterocyclic radical of 1 to 2 rings each containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur while taken together R_3 and R_4 can complete a benzene ring and R_1 is a hydrocarbon or heterocyclic radical as above defined for R_2, R_3 and R_4.

4,115,061

COMBINATION METHOD FOR CLEANING GREATLY SOILED TEXTILES

Werner Grünewälder, Haan, Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Jan. 26, 1977, Ser. No. 762,502
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603802
Int. Cl.[2] D06L *1/08, 1/22*
U.S. Cl. 8—137 12 Claims

1. A method for cleaning greatly soiled textiles with organic solvents and aqueous detergent solutions consisting essentially of (1) contacting greatly soiled textiles with a cleaning liquor consisting of (A) a customary water-immiscible, organic dry-cleaning solvent and (B) an aqueous solution of a detergent composition containing from 3.5 to 35% by weight of said solution of an anionic surfaceactive compound with a low solubility in said organic dry-cleaning solvent, wherein from 0.5 to 10 gm of said detergent composition are present per liter of said cleaning liquor, for a time sufficient to clean said soiled textiles and to have said textiles substantially absorb said aqueous solution of a detergent composition, (2) removing the soiled organic dry-cleaning solvent from said textiles containing said absorbed aqueous solution of a detergent composition, (3) contacting said textiles containing said absorbed aqueous solution of a detergent composition with sufficient water at a temperature and for a time sufficient to completely wash said textiles, (4) rinsing said textiles with water, and (5) recovering said cleaned textiles,

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4,115,062

CANCER DETECTION BY SERUM ANALYSIS OF GLYCOLIPIDS

D. James Morre, West Lafayette; Thomas M. Kloppel, Lafayette, and Thomas W. Keenan, West Lafayette, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jun. 13, 1977, Ser. No. 805,691
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 11 Claims

1. A method for detection of cancer comprising the steps of:
extracting a viable organic matter sample taken from a test subject with an organic solvent to recover a reproducible fraction of lipid associated sialic acid;
concentrating the extract obtained by the preceding step using conditions that minimize destruction of sialic acid;
adding sufficient chloroform-methanol to form a single phase;
adjusting the ionic strength and pH of the sample to remove glyco-proteins, proteolipids and other related materials by precipitation;
removing the precipitates that resulted from the preceding step;
drying the soluble phase of the sample whereby organic solvents are removed;
hydrolyzing the dried soluble phase of the sample to free the bound sialic acid;
determining the free sialic acid of the sample;
correcting the determination of the preceding step empirically for unspecific absorbance due to residual lipids and other related materials; and
comparing the sialic acid content per unit of the starting sample with comparable values for cancer free subjects whereby a predetermined elevation in sialic acid indicates cancer.

4,115,063

METHOD FOR DETERMINING THE INORGANIC AND METALLO-ORGANIC SALT CONTENT IN AN ORGANIC SOLVENT

Donald R. Demers, Nashua, N.H., assignor to Baird-Atomic, Inc., Bedford, Mass.

Filed Apr. 11, 1977, Ser. No. 786,663
Int. Cl.[2] G01N *33/22, 21/58*
U.S. Cl. 23—230 M 14 Claims

1. A method for determining inorganic and metallo-organic salt content in an organic solvent comprising the steps of:
(a) adding a polar first solvent to a sample of an organic second solvent to be analyzed, said polar first solvent being substantially free of the inorganic salt to be measured;
(b) mixing said polar first solvent and said organic second solvent to form an intermediate, two phase solution;
(c) mixing and dissolving said intermediate solution in a third

solvent to form a final, single phase solution, said first and second solvents being mutually soluble in said third solvent; and

(d) measuring said inorganic salt content of said final solution by a flame atomic spectroscopy technique.

4,115,064

METHOD FOR BILIRUBIN DETERMINATION

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Continuation of Ser. No. 765,960, Feb. 7, 1977, abandoned. This application Nov. 18, 1977, Ser. No. 852,718

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **9 Claims**

1. In the method for determining bilirubin glucuronide in a sample containing both free bilirubin and bilirubin glucuronide comprising reacting the bilirubin glucuronide with diazotized sulfanilic acid to form a complex at a pH where said free bilirubin does not react with said acid, destroying any residual diazotized sulfanilic acid, and raising the pH so that colorimetric or spectrophotometric measurement of the complex can be achieved with minimization of interference from natural colorants; the improvement wherein there is used for the purpose of destroying the residual diazotized sulfanilic acid a combination of hydrazine and hydrazide.

4,115,065

SATURATION ANALYSIS OF FOLATE COMPOUND WITH SELENIUM-75 LABELED FOLATE

Russell James Bayly; Virginia Edith May Chambers, and Reginald Monks, all of Amersham, England, assignors to The Radiochemical Centre Limited, England

Filed Dec. 11, 1974, Ser. No. 531,748

Claims priority, application United Kingdom, Dec. 11, 1973, 57433/73

Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 23—230.6 **2 Claims**

1. A method of performing a saturation analysis of a folate compound by causing the compound which is to be analysed and a radioactively labelled version of the said compound to compete for reaction with a binding reagent for the said compound, which is present in an amount insufficient to combine with all of said compounds and the labelled version thereof, separating the bound compound from the unbound compound and measuring the radioactive concentration of one or both of the bound and the unbound compound,

wherein the improvement comprises selecting a selenium-75 labeled version of said folate to compete for reaction with said binding reagent.

4,115,066

HIGH PRESSURE MIXING HEAD

Dietrich Muhle, Kressbronn, Fed. Rep. of Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

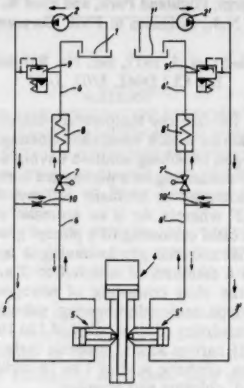
Filed Nov. 18, 1976, Ser. No. 742,906

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1975, 2555156

Int. Cl.[2] B01F *15/02, 5/10*

U.S. Cl. 422—133 **5 Claims**

1. A high pressure mixing head for mixing at least two different plastic material components, comprising a casing having an axially elongated cylindrical mixing chamber having an open outlet at one end, separate inlet valve chambers and feed channels in respective flow-communication therewith in said head for each of said plastic material components and separate inlet ports respectively connecting said valve chambers to said mixing chamber at a point intermediate the axial extent thereof in said casing, an inlet valve located in each of said valve chambers and movable into and out of closing position in the respective inlet ports at the upstream side thereof, separate return flow channels in said casing respectively communicating with said chambers, an expulsion piston whose surface is free of return grooves and makes a lapped fit in said mixing chamber, said piston being movable axially towards a retracted position in said mixing chamber during which said inlet ports are simultaneously uncovered and, alternatively, toward an



extended position during which said inlet ports are simultaneously covered by said piston and the face of said piston becomes substantially flush with said mixing chamber outlet, and means for reciprocating said piston.

4,115,067

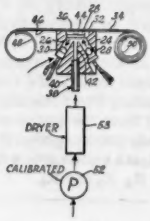
POLLUTION MONITORING APPARATUS

Norman A. Lyshkow, Chicago, Ill., assignor to Combustion Equipment Associates Inc., Stanford, Conn.

Division of Ser. No. 617,855, Sep. 29, 1975, Pat. No. 4,032,297, which is a continuation of Ser. No. 479,227, Jun. 14, 1974, abandoned. This application Feb. 25, 1977, Ser. No. 772,301

Int. Cl.[2] G01N *21/14, 21/30, 21/48*

U.S. Cl. 422—56 **4 Claims**



1. A pollutant gas-sensitive substrate which is light reflective comprising a tape formed of a flexible material and a light reflective coating on the tape, with silica having been impregnated with a composition selected from the group consisting of:

(1) a mixture of sulfanilic acid and N-(1-naphthyl)/ethylenediamine dihydrochloride;

(2) a mixture of iodine and 4,4'-methylenebis-(N,N'-dimethylanaline);

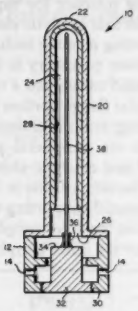
(3) lead acetate; and

(4) palladium chloride.

4,115,068
AIR DETECTING DEVICE FOR STEAM OR GAS STERILIZERS

Larry James Joslyn, Walworth, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,093
Int. Cl.[2] A61L *3/02;* **G01N** *25/00, 31/22*
U.S. Cl. 422—56 **10 Claims**



1. An air detecting device for sterilizers and the like comprising:

(a) an upright tube of heat insulating material, said tube having a closed top and an open bottom and defining an elongated chamber, said tube being adapted to be placed within a sterilizer so as to put said chamber in communication with the environment within the sterilizer through the open bottom of said upright tube;

(b) a heat sink within said chamber for condensing at least part of any steam entering said chamber through the open bottom of said tube, the steam in said chamber condensed by said heat sink falling by gravity back through said tube while any air entrained with the steam entering said chamber becomes entrapped in and provides a heat insulator in said chamber adjacent the closed top of said tube thereby establishing a lower temperature adjacent the top of said tube than adjacent the bottom of said tube;

(c) a thermal indicator strip in said chamber spaced from said heat sink;

(d) means for supporting said thermal indicator strip whereby said strip extends from the open bottom to the closed top of said tube so that said strip extends substantially the full height of said chamber; and

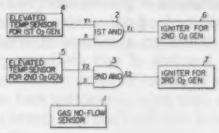
(e) said thermal indicator strip being temperature sensitive so as to undergo a permanent color change responsive to the temperature within said chamber to provide a record of the temperature from the top to the bottom of said chamber, said temperature being directly correlated to the amount of air entrapped adjacent the top of said chamber.

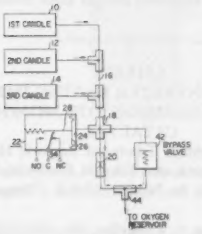
4,115,069
SEQUENTIAL IGNITION SYSTEM FOR OXYGEN GENERATION ELEMENTS

Frank Eugene Martin, Chester, and Edward Larmour Rich, III, Arnold, both of Md., assignors to Midori Anzen Company, Ltd., Tokyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,580
Claims priority, application Japan, Jun. 18, 1976, 51-71013
Int. Cl.[2] B01J *7/00*
U.S. Cl. 422—112 **4 Claims**

1. A sequential ignition system for an oxygen generation device comprising a plurality of chemical oxygen generation elements each burning to generate oxygen, a common feed conduit connected to all said chemical oxygen generation elements to cause said oxygen from each of said oxygen generation elements to flow therethrough, gas flow sensor means connected to said feed conduit downstream of the most downstream oxygen generation element to provide a first control signal in response to a flow rate less than a predetermined minimum magnitude of said oxygen flowing through said feed conduit, manually operated igniter means for igniting a first one of said chemical oxgen generation elements, a plurality of igniter means for said chemical oxygen generation elements except the first one, a plurality of temperature sensor means operatively coupled to said chemical oxygen generation elements respectively except for the chemical oxygen generation element to be last ignited, each of said temperature sensor


ELEVATED TEMP SENSOR FOR 1ST O2 GEN
1ST AND
IGNITER FOR 2ND O2 GEN
ELEVATED TEMP SENSOR FOR 2ND O2 GEN
2ND AND
IGNITER FOR 3RD O2 GEN
GAS NO-FLOW SENSOR

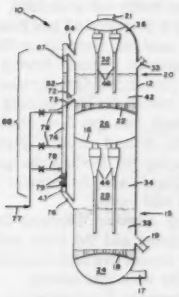


means being responsive to the burnt heated state of the associated chemical oxygen generation element to provide a second control signal, and an AND gate including one input connected to said gas flow sensor means, the other input connected to said temperature sensor means for each of said chemical oxygen generation elements, and an output connected to said igniter means for the next succeeding oxygen generation element, each of said AND gates responding to both said first and second control signals applied thereto to provide an output to actuate the associated igniter means to ignite the oxygen generation element operatively coupled thereto.

4,115,070
TRANSFER PIPE SYSTEM

Walfred Wilhelm Jukkola, Westport, Conn., and Giorgio Tomasicchio, Milan, Italy, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,414
Int. Cl.[2] B01J *8/28*
U.S. Cl. 422—142 **7 Claims**



1. A transfer pipe system for moving particulate bed material from the reaction chamber of a relatively low pressure fluid

bed unit at a first elevation to a relatively high pressure secondary reaction chamber at a lower elevation, comprising an inclined discharge pipe extending downwardly from the fluidized bed region of said reaction chamber, a substantially vertical transfer pipe connected to said discharge pipe and having gravity feed connection to said secondary reaction chamber, gas injection means spaced along said vertical transfer pipe to introduce fluidizing gas into said transfer pipe, so that a substantial quantity of the particulate material therein is maintained in a fluidized state, valve control means positioned in said transfer pipe system to control the flow of particulate material under the influence of gravity from said vertical transfer pipe into said gravity feed connection for delivery to said secondary reaction chamber; a vertical standpipe extending upwardly from the junction of said discharge pipe with said vertical transfer pipe to an elevation above the bed level in said fluid bed unit and a vent pipe connecting said standpipe with the freeboard region of said fluid bed unit thereby routing most of the fluidizing gas provided to said transfer pipe system directly to said freeboard region rather than through said discharge pipe so that flow of particulate material through said discharge pipe is not impeded by gas flow from said vertical transfer pipe.

4,115,071

CATALYTIC CONVERTER HAVING IMPROVED SUPPORTING MEMBERS FOR MONOLITHIC CATALYST

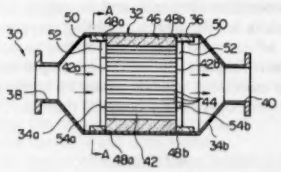
Tetsuzo Masuda, Hachioji; Tomiyasu Tagawa; Hachiro Yoshioka, both of Yokohama, and Takashi Akahoshi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 9, 1976, Ser. No. 740,225

Claims priority, application Japan, Nov. 14, 1975, 50/154694[U]

Int. Cl.[2] F01N *3/15*

U.S. Cl. 422—179 **5 Claims**



1. A catalytic converter for purifying exhaust gases emitted from an automotive internal combustion engine, comprising:

a cylindrical catalytic casing defining an enclosed cylindrical space, and having a gas inlet and a gas outlet;

a cylindrical catalytic element of lesser diameter than the enclosed space and positioned within said casing, said catalytic element being of a unitary, solid monolithic structure having a plurality of gas flow channels therethrough, and a catalytic material on the surface of the channels, said catalytic element having first and second parallel circular planes, the first circular plane facing the gas inlet of said casing for introducing the gases in said casing therethrough into gas flow channels of said catalytic element, the second circular plane facing the gas outlet of said casing for feeding the gases from the gas flow channels of said catalytic element therethrough into the gas outlet of said casing;

a radial supporting member disposed between the inner surface of said casing and the outer surface of said catalytic element for supporting said catalytic element radially and concentrically with said casing;

a first supporting member for supporting said catalytic element to prevent said catalytic element from axial movement, said first supporting member including an annular flange portion whose outer periphery is directly secured to the inner surface of said casing, and a radial annular disc portion integral with the annular flange portion and radially concentrical with said casing, said radial annular disc portion being contactable with the peripheral portion of the first circular plane of said catalytic element;

means defining a plurality of slits in the radial annular disc portion of said first supporting member, the slits radially extending from the inner periphery of the radial annular disc portion to the outer periphery of the same;

a second supporting member for supporting said catalytic element to prevent said catalytic element from axial movement, said supporting member including an annular flange portion whose outer periphery is directly secured to the inner surface of said casing and a radial annular disc portion with an annular flange portion and radially concentrical with said casing, said radial annular disc portion being contactable with the peripheral portion of the second circular plane of said catalytic element; and

means defining a plurality of slits in the radial annular disc portion of said second supporting member, the slits radially extending from the inner periphery of the radial annular disc portion to the outer periphery of the same.

4,115,072

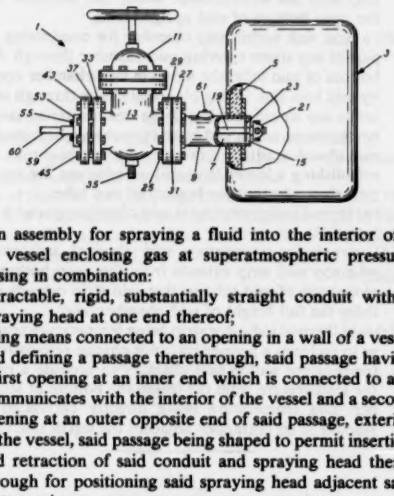
RETRACTABLE FLUIDS SPRAYING ASSEMBLY

William C. Nielsen, Aiea, Hi., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 7, 1977, Ser. No. 785,721

Int. Cl.[2] B01J *3/02*; B01L *1/00*; B05B *1/00*

U.S. Cl. 422—207 **3 Claims**



1. An assembly for spraying a fluid into the interior of a walled vessel enclosing gas at superatmospheric pressure, comprising in combination:

a retractable, rigid, substantially straight conduit with a spraying head at one end thereof;

housing means connected to an opening in a wall of a vessel and defining a passage therethrough, said passage having a first opening at an inner end which is connected to and communicates with the interior of the vessel and a second opening at an outer opposite end of said passage, exterior to the vessel, said passage being shaped to permit insertion and retraction of said conduit and spraying head therethrough for positioning said spraying head adjacent said first opening;

means rigidly defining an orifice removably positioned across said passage and adjacent said second opening thereof, said orifice being sized to permit sliding said conduit therethrough with the perimeter of said orifice closely spaced around conduit to minimize escape of gas from said vessel through said orifice;

means releasably fixed to said passage for selectively closing off said passage between said orifice and said first opening with said spraying head positioned adjacent said orifice within said passage for removal of said orifice to permit inspecting said spraying head with said passage closed off; and

means releasably fixed to said outer end of said passage for selectively closing off said passage to prevent the escape

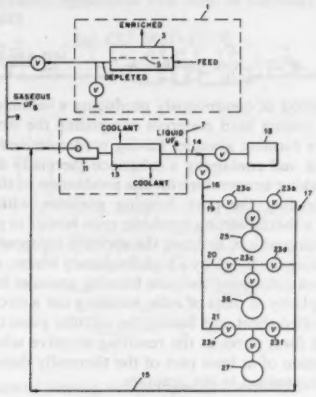
of gases through said passage and said orifice with said conduit positioned extending through said orifice.

4,115,073

PROCESS GAS SOLIDIFICATION SYSTEM

William G. S. Fort, and William W. Lee, Jr., both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,860
Int. Cl.[2] G21F 9/02; C01G 43/06
U.S. Cl. 23—293 R **10 Claims**



1. In a process wherein gaseous UF_6 is withdrawn from a first system and directed into a second system for converting the gas to liquid UF_6 at an elevated temperature, the improved method for withdrawing the resulting liquid UF_6 from the second system and storing it as a solid in a plurality of storage vessels, said method comprising the steps of:

(a) directing an increment of liquid UF_6 from the second system into a first closed storage vessel;

(b) flash-evaporating UF_6 from the first vessel into one of the first system and second system to cool and solidify UF_6 in the first vessel while directing an increment of liquid UF_6 from the second system into a second closed storage vessel;

(c) flash-evaporating UF_6 from the second vessel into one of the first system and second system to cool and solidify UF_6 in the second vessel while directing another increment of liquid UF_6 from the second system into the first vessel; and

(d) flash-evaporating UF_6 from the first vessel into one of the first system and second system to cool and solidify additional UF_6 in the first vessel.

4,115,074

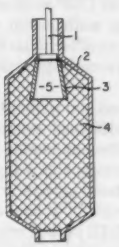
GASIFICATION PROCESS

Kenji Yoshida, Fujisawa; Kazuyoshi Isogaya; Tadayoshi Tomita, both of Yokohama; Katsutoshi Kikuchi, Fujisawa, and Hisaharu Kuboyama, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc. and Toyo Engineering Corporation, both of Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,168
Claims priority, application Japan, Dec. 26, 1975, 50-155111
Int. Cl.[2] C10J 1/06
U.S. Cl. 48—95 **8 Claims**

1. In an apparatus for the catalytic partial oxidation of heavy residual oil-containing hydrocarbons to give a gas mixture, said apparatus comprising a reaction vessel containing an atomization nozzle and a fixed catalyst bed spaced from said atomization nozzle, the improvement which comprises: means defining a catalyst-free atomizing zone extending from said atomization nozzle and projecting into said fixed catalyst bed, said atomizing zone having a cylindrical or frustoconical shape; the inside diameter of the end of said atomizing zone adjacent said atomization nozzle having a diameter within twice as large as the diameter of said nozzle; the angle of the sidewall of said atomizing zone being smaller than the atomization angle of the streams from said nozzle; and all the inside wall of said atomizing zone being visible from the center of the nozzle.

2. In a gasification process for forming a gas mixture containing hydrogen by atomizing in nozzle means a hydrocarbon containing a heavy residual oil with a mixture of an oxygen-containing gas and steam, mixing same in an atomizing zone to form a uniform mixture containing atomized liquid hydrocarbon and contacting said mixture containing the atomized liquid hydrocarbon with a fixed catalyst bed, the improvement comprising:



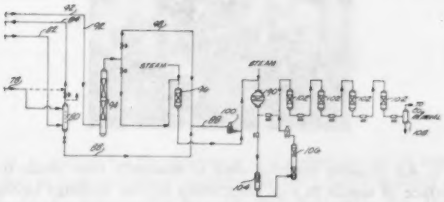
directing one or more jet streams of atomized hydrocarbon, oxygen-containing gas and steam from said nozzle means into said atomizing zone at a velocity of from 100 m/sec to sonic velocity at the nozzle outlet, and after mixing same in said atomizing zone introducing said mixture to the catalyst bed while maintaining the residence time of said hydrocarbon in said atomizing zone in the range of from 0.05 to 5 seconds, substantially without forming eddy current, and carrying out the reaction at a temperature of from 850° C. to 1200° C. to form said gas mixture while avoiding deposition of solid carbon on said catalyst bed.

4,115,075

PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM CARBONACEOUS MATERIALS

Gerald P. McNamee, Santa Ana; Theodore R. Roszkowski, Malibu; David W. Stanbridge, Pacific Palisades, and Gerald A. White, Los Angeles, all of Calif., assignors to The Ralph M. Parsons Company, Pasedena, Calif.

Continuation-in-part of Ser. No. 707,004, Jul. 20, 1976, Pat. No. 4,050,908. This application Mar. 21, 1977, Ser. No. 779,922
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.[2] C10J 3/16; C10K 3/04
U.S. Cl. 48—197 R **42 Claims**



36. In a process for the recovery of hydrocarbon values from solid carbonaceous materials where there is formed a reformable liquid hydrocarbon and a vapor stream comprising hydro-

carbons, carbon monoxide, carbon dioxide and hydrogen, an improvement for the production of methane from the reformable liquid hydrocarbon and the vapor stream which comprises:

(a) methanating a portion of vapor stream in the presence of steam and a high temperature methane forming alumina based catalyst containing from about 5 to about 50% by weight of at least one metal of the third period of Group VIII of the Periodic Table on a temperature stable alumina support in a first methanation zone having an inlet temperature of at least about 800° F., and an exit temperature up to about 1500° F.;

(b) combining, with steam, the effluent of the methanation zone, the balance of the vapor stream and the liquid hydrocarbon in a catalytic reforming stage where, at a temperature from about 1200° to about 1500° F. maintained by the effluent of the methanation stage, hydrocarbons are reformed to yield an effluent gas stream comprising steam, hydrogen, carbon monoxide, carbon dioxide and methane; and

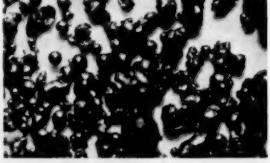
(c) passing the efflunet gas stream from the reforming stage to at least one additional methanation stage where the hydrogen and carbon monoxide react to form additional methane in the presence of a high temperature methane forming alumina based catalyst containing from about 5 to about 50% by weight of at least one metal from the third period of Group VIII of the Periodic Table on a temperature stable alumina support, the inlet temperature to said methanation stage being at least about 700° F. and the exit temperature being up to about 1500° F.

4,115,076

ABRASIVE MATERIAL SUITABLE FOR MANUALLY BLAST CLEANING FERROUS METALS PRIOR TO PAINTING

Henry W. Hitzrot, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 24, 1977, Ser. No. 800,108
Int. Cl.[2] C21D *7/06;* B24C *1/10*
U.S. Cl. 51—295 **9 Claims**



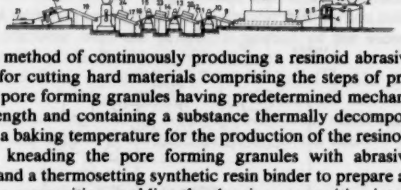
1. An abrasive material used to manually blast clean the surface of metals in situ, comprising scarfer spittings having particles which have a size of −6 mesh characterized by having a iron containing core surrounded by a shell of iron oxides, a specific gravity of 5 to 6 and a bulk density of not less than 180 pounds per cubic foot (2.88 grams per cubic centimeter).

4,115,077

METHOD OF CONTINUOUSLY PRODUCING RESINOID ABRASIVE WHEELS FOR CUTTING HARD MATERIALS

Heijiro Fukuda, No. 123, 3-chome, Umegaoka, Nagaokakyo, Japan (617)

Filed Jul. 1, 1977, Ser. No. 812,297
Claims priority, application Japan, Feb. 28, 1977, 52-21803
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.[2] C09K *3/14;* B24D *3/32*
U.S. Cl. 51—296 **13 Claims**



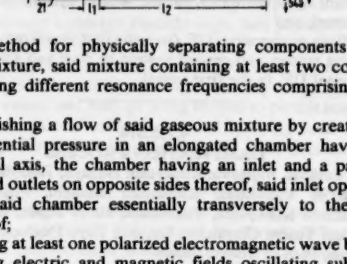
1. A method of continuously producing a resinoid abrasive wheel for cutting hard materials comprising the steps of preparing pore forming granules having predetermined mechanical strength and containing a substance thermally decomposable at a baking temperature for the production of the resinoid wheel, kneading the pore forming granules with abrasive grains and a thermosetting synthetic resin binder to prepare an abrasive composition, molding the abrasive composition into a block, heating the block by a high frequency heater, rolling the heated block containing the pore forming granules into a sheet by a multiplicity of pairs of rolls, blanking out a circular piece from the rolled sheet, and baking the circular piece to cure the binder and form pores in the resulting abrasive wheel by the decomposition of at least part of the thermally decomposable substance contained in the granules.

4,115,078

SEPARATION OF GASEOUS MIXTURES OF MATTER

Karl Janner, Erlangen, and Klaus Gregorius, Neunkirchen am Brand, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Ruhr, Fed. Rep. of Germany

Filed May 21, 1975, Ser. No. 579,544
Int. Cl.[2] B03C *3/38*
U.S. Cl. 55—2 **12 Claims**



8. A method for physically separating components of a gaseous mixture, said mixture containing at least two components having different resonance frequencies comprising the steps of:

a. establishing a flow of said gaseous mixture by creating a differential pressure in an elongated chamber having a central axis, the chamber having an inlet and a pair of spaced outlets on opposite sides thereof, said inlet opening into said chamber essentially transversely to the axis thereof;

b. passing at least one polarized electromagnetic wave beam, having electric and magnetic fields oscillating substantially in phase as in a normally progressing wave, through the mixture with the phase of the dipole moment of the molecules of the components of the mixture to be deflected being shifted by said beam so that said dipole moment lags by an angle approximately between the limits of 45° and 135°, in the direction of the axis of the elongated chamber, said beam having a frequency which causes the at least two components of said mixture to be differentially influenced in regard to their dipole behavior whereby said

beam will act thereupon to cause deflection of the components of the mixture in different directions; and

c. collecting said components after deflection.

4,115,079

REMOVING POLLUTANTS FROM AQUEOUS LIQUOR USED TO SCRUB FUEL GASIFICATION PRODUCT

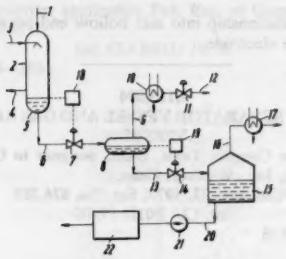
Günter Pockrandt, Bad Homburg, and Helmut Fellner, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 20, 1977, Ser. No. 789,302

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617648

Int. Cl.² B01D *19/00*

U.S. Cl. 55—43 BN **5 Claims**



1. A proces of treating scrubbing water which has been used to scrub a hot raw gas produced by the gasification of a solid, liquid or gaseous fuel, which scrubbing water has dissolved therein hydrogen sulfide and additional gaseous pollutants, comprising flashing the used scrubbing water from a temperature of at least 100° C and a pressure of at least about 5 bars in at least one preliminary flashing stage to an intermediate pressure in the range of about 1.1 to 4 bars, separating the flashed-off gases containing the bulk of the hydrogen sulfide and pollutants from the residual scrubbing water, then flashing off the residual scrubbing water in a final flashing stage to atmospheric pressure, separating water vapor containing flashed-off gases from said final flashing stage, and treating said flashed-off gases from said final flashing stage separately from said gases from said preliminary flashing stage.

4,115,080

SEPARATION PROCESS

Michael J. Clark, and Howard L. Rohrmoser, both of Ludington, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 7, 1976, Ser. No. 721,019

Int. Cl.² B01D *47/02*

U.S. Cl. 55—54 **15 Claims**

1. A method for separating contaminants from steam comprising:

(a) conveying water at a temperature corresponding to the temperature at which the contaminated steam is saturated with water at the pressure of the contaminated steam into an enclosed treatment scrubber containing a plurality of baffles;

(b) continuously passing the water through the baffles at a predetermined rate;

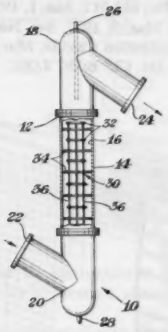
(c) countercurrently passing the contaminated steam upward through the baffles to contact the contaminants with the water, and thereby remove at least a portion of the contaminants from the steam;

(d) recovering water and contaminants therein from the scrubber;

(e) recovering steam and water entrained therein from the scrubber.

15. A method for removing entrained contaminants including at least one member selected from the group consisting of calcium chloride, calcium carbonate and calcium sulfate from steam comprising:

(a) introducing condensed steam at a temperature corresponding to the temperature at which contaminated steam is saturated with water at the pressure of the contaminated steam into an enclosed treatment scrubber containing a plurality of baffles in the interior thereof;



(b) passing the water through the scrubber at a rate sufficient to form a cascading film of water on the surface of the baffles;

(c) countercurrently passing contaminated steam generated during the evaporation of an aqueous solution of calcium chloride through the scrubber;

(d) recovering water and contaminants entrained therein from the bottom of the scrubber;

(e) recovering steam and water entrained therein from the top of the scrubber.

4,115,081

PROCESS FOR SEPARATION OF A MIXED GAS

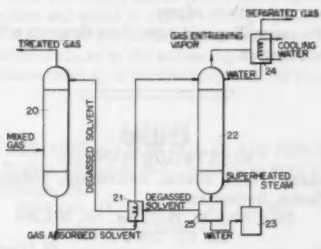
Masayoshi Ohno, Yokohama; Akio Kakuta, Kawasaki, both of Japan; Terukatsu Miyauchi, 75 Kashiwaba, Naka-ku, Yokohama-shi, Japan, and Tatsuji Kikuchi, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Yokohama and Terukatsu Miyauchi, Kawasaki, both of, Japan

Filed Nov. 8, 1976, Ser. No. 739,951

Claims priority, application Japan, Nov. 18, 1975, 50-138303

Int. Cl.² B01D *53/14*

U.S. Cl. 55—64 **6 Claims**



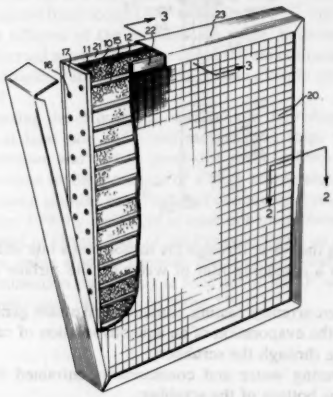
5. A process for the separation of a mixed gas which comprises at least two gases selected from the group consisting of H_2, N_2, O_2, He, Ar, Kr, Xe, CO_2, NO, N_2O, NO_2, SO_2, H_2S, CS_2, CH_4, C_2H_2, C_2H_6, C_2H_3Cl, and CH_2CHCN, comprising the step of passing said gas through a solvent to separate said mixed gas by utilizing the differences in solubility of the constituent gases thereof in said solvent, wherein the improvement

comprises employing methylphenyl silicone oil as said solvent in order to separate said mixed gas.

4,115,082
AIR CLEANER ASSEMBLY

John Henry Newell, Ancaster, Canada, assignor to Newtron Co. (Ancaster) Ltd., Ancaster, Canada

Continuation of Ser. No. 691,517, Jun. 1, 1976, abandoned. This application Mar. 9, 1977, Ser. No. 775,688
Claims priority, application Canada, Mar. 16, 1976, 248135
Int. Cl.² B03C *3/30*
U.S. Cl. 55—103 **6 Claims**



1. An air cleaner assembly of the flow-through type comprising:

a central element comprising two sheets of rubbery synthetic open cell foam polyurethane disposed mutually parallel and adjacent to one another;

first and second series of rods of acrylic plastic, the first and second series of rods sandwiching the central element therebetween, and contacting outer surfaces of respective ones of the two sheets of foam comprising the central element, and extending from side to side across the outer surfaces thereof;

first and second air permeable outer sheet elements of interwoven fibres of polypropylene, said elements being disposed outwardly of the respective first and second series of rods;

thermoplastic side frame members to which the acrylic rods are secured at their edges;

means for assembling said outer sheet elements with said side frame members.

4,115,083
ELECTRODE HANGER

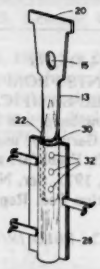
Xaver Johann Huppi, Zurich, Switzerland, assignor to Elex A.G., Zurich, Switzerland

Filed May 31, 1977, Ser. No. 802,264
Int. Cl.² B03C *3/40*
U.S. Cl. 55—148 **3 Claims**

1. An electrode hanger and discharge electrode assembly for an electrostatic precipitator having a current carrying support member, comprising:

(a) an elongated discharge electrode having one end formed with a hollow portion; and,

(b) a unitary electrode hanger having an upper end with means thereon engageable with the current carrying support member and a lower end with generally outwardly extending wing portions configured and positioned in

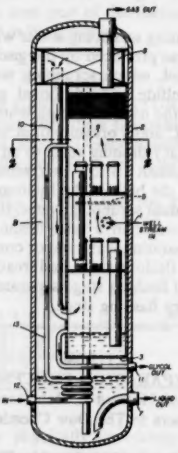


mating relationship into said hollow end portion of said discharge electrode.

4,115,084
COMBINED SEPARATOR VESSEL AND GAS ABSORBER VESSEL

Robert Wayne Coggins, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 22, 1977, Ser. No. 826,285
Int. Cl.² B01D *19/00*
U.S. Cl. 55—176 **2 Claims**



1. A separation and dehydration system for a mixture of gas and liquid including,

a vertically extended cylindrical separator shell,

the vertically extended cylindrical absorber tower of a liquid dessicant system mounted within the separator shell with its vertical axis horizontally displaced from the axis of the separator,

a conduit connected through the separator shell to conduct a mixture of gas and liquid from a source and to direct the mixture into impact upon the external wall of the tower to initiate separation of the gas and liquid,

a first path for the separated gas extended between the impact area and the upper volume within the separator shell,

a second path for the separated liquid extended from the impact area to the lower volume within the separator shell,

a body of liquid in the lower volume within the separator shell arranged at the end of the second path to receive the separated liquid from the second path,

a conduit extended from the upper volume within the separator shell to the lower volume within the absorber tower for the separated gas,

a source of hot lean liquid dessicant connected to the upper volume within the absorber tower,

whereby the absorber tower functions as a source of heat within the separator to control hydrate formation and paraffin solidification within fluids flowing through the separator in which separated gas is contacted directly by the dessicant to dehydrate the gas.

4,115,085
APPARATUS FOR EXPELLING GASES FROM LIQUID ADHESIVES

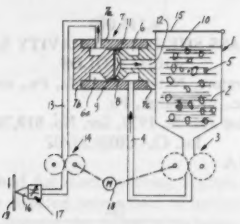
Karl-Heinz Barbe, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. Kg., Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,336

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634548

Int. Cl.² B01D *19/00*

U.S. Cl. 55—193 **10 Claims**



1. Apparatus for expelling gases from a liquid adhesive supplied to the applicator of a machine which produces and/or processes smokers' products and wherein the adhesive is applied to a running web of wrapping material or the like, comprising a vessel arranged to store a supply of gas-containing adhesive; conduit means connecting said vessel with said applicator; a gas removing device installed in said conduit means and including an annular channel having a flow restricting portion, said device further having a gas-evacuating gap communicating with said portion of said channel; and means for conveying adhesive in said conduit means from said vessel, through said channel and to said applicator, including means for maintaining the adhesive at a higher pressure upstream and at a lower pressure downstream of said device.

4,115,086
RECOVERY OF LIGHT HYDROCARBONS FROM REFINERY GAS

Charles H. Jordan, Houston, Tex., and Ajit Sampat, London, England, assignors to Fluor Corporation, Los Angeles, Calif.

Filed Dec. 22, 1975, Ser. No. 642,902

Int. Cl.² F25J *3/02*

U.S. Cl. 62—28 **6 Claims**

1. A process for the recovery of light hydrocarbons from a feed stream of refinery gas comprised of methane and said light hydrocarbons comprising:

(a) compressing and cooling the stream to liquify substantially all C_3 and higher hydrocarbons and a major portion of the C_4 hydrocarbons present in the stream;

(b) separating as a vapor phase the unliquified portion of the stream from the liquid portion;

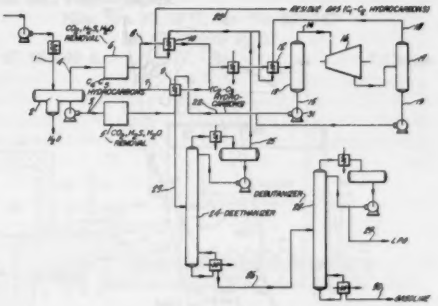
(c) cooling the vapor phase to liquify a major portion of the C_2 hydrocarbons present in the vapor phase;

(d) separating the vapor from the liquid portion and expansively cooling the vapor to at least about −120° F;

(e) separating any liquid formed by the expansion from the vapor;

(f) combining the liquified portions of the feed stream;

(g) separating the methane from said combined liquid portion as a vapor and adding said methane vapor to said vapor phase prior to expansively cooling said vapor phase;



(h) separating the C_2 hydrocarbons from said combined liquid portions at a pressure above that of said vapor phase; and

(i) distilling the remainder of said combined liquid portions to separate light hydrocarbon fractions.

4,115,087
OPTICAL FIBRES

David Joseph Martin, London, England, assignor to BICC Limited, London, England

Filed Apr. 5, 1977, Ser. No. 784,732

Claims priority, application United Kingdom, Apr. 7, 1976, 14108/76

Int. Cl.² B05D *1/40;* **G02B** *5/14, 1/10*

U.S. Cl. 65—3 C **8 Claims**

1. A method of applying a continuous coating of hardenable material to an advancing optical fibre which comprises causing an optical fibre advancing in the direction of its length to pass between two continuously moving endless surfaces which are positioned on opposite sides of the advancing fibre and each of which carries a layer of hardenable material in a liquefied state in such a way that the advancing optical fibre is at least partially immersed in each of said layers, the distance that each endless surface is spaced from the advancing optical fibre and the thickness of the layer of hardenable material on each endless surface being such that opposite parts of the advancing fibre pass through said layers of hardenable material with substantially no physical contact taking place between the fibre and the endless surfaces themselves, and driving the endless surfaces in such a direction and at such a speed having regard to the direction and speed of the advancing optical fibre that hardenable material in a liquefied state is transferred from the moving endless surfaces to the advancing fibre to form on the fibre continuous coating of substantially uniform thickness.

4,115,088
BINDER APPLICATOR FOR GLASS FIBERS

Marvin E. Walker, Lawndale, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

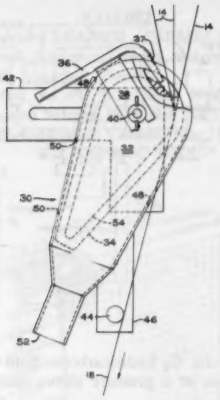
Filed Oct. 31, 1977, Ser. No. 846,961

Int. Cl.² C03B *37/02*

U.S. Cl. 65—11 W **10 Claims**

1. An applicator for applying binder and/or size to glass filaments comprising a gathering element to combine said filaments into a strand, means for supplying binder and/or size to said gathering element, a housing containing said gathering element, said housing having an opening through which said strand passes, said opening being arranged to permit downward airflow along the path of said strand, a strand guide means and means for positioning said applicator in a glass fiber

forming apparatus, said gathering element and said housing each having a generally inverted teardrop shape in longitudinal section and said positioning means being arranged to guide said strand across a downward airstream associated with formation of said strand to thereby remove excess binder and/or size from said strand with said air stream and recover said excess binder and/or size in said housing without diverting said downward airstream from its normal path.



4,115,089

PROCESS AND APPARATUS FOR MAKING EXPANDED SLAG

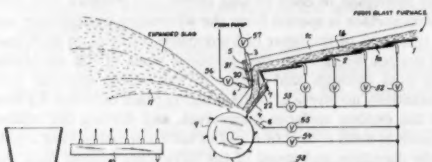
Paul Metz, Luxembourg; Robert Schockmel, Esch, Alzette; Desire Nick, Differdange, and Paul Pfeiffer, Esch, Alzette, all of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg, Luxembourg

Filed Oct. 21, 1976, Ser. No. 734,553

Claims priority, application Luxembourg, Oct. 21, 1975, 73623

Int. Cl.[2] C03B *19/10*

U.S. Cl. 65—19 **3 Claims**



3. A process for producing an expanded slag which comprises the steps of:

(a) passing molten slag downwardly along an inclined channel while supplying water between the slag and the floor of said channel to preexpand said slag;

(b) cascading a stream of slag from the lower end of said channel downwardly;

(c) intercepting the cascade of slag with a surface of a plate inclined to the horizontal, and wetting said surface to further expand said slag;

(d) generating a water curtain in the form of a mist across a space between arrays of atomizing nozzles between said surface and a slag-collecting bin;

(e) disintegrating the streams of further expanded slag by depositing same upon a rotating drum to disperse the further expanded slag as particles adjacent said surface;

(f) hurling said particles of slag projected from said drum through said mist of water and into said collecting bin;

(g) directing water against a surface of the cascade of slag opposite said plate;

(h) directing water against said drum along a line upon which said slag impinges upon said drum;

(i) confining said cascade between said surface of said plate and an oppositely inclined surface of a second plate juxtaposed with said cascade and forming a gap with the first plate traversed by the said cascade, said second plate forming a gap converging in the direction of flow of said slag toward said slag; and

(j) introducing water into the last-mentioned gap.

4,115,090

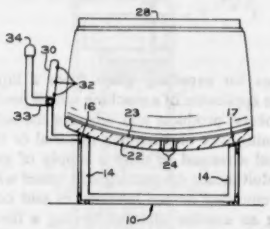
SHAPING GLASS SHEETS BY GRAVITY SAGGING ON SOLID MOLDS

John A. Comperatore, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1977, Ser. No. 819,783

Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—25 A **8 Claims**

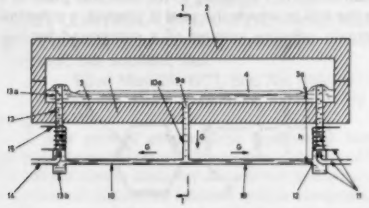


1. In the method of bending a glass sheet by gravity sagging in a gas fired kiln comprising supporting said glass sheet in bending relation above a substantialy continuous upwardly facing shaping surface of a bending mold having a permanent shape conforming to that desired for the sheet after shaping, inserting said mold supporting said sheet within said gas fired kiln, heating said sheet within said kiln to an elevated temperature sufficient to soften said glass sheet whereby said glass sheet sags a predetermined sag distance toward said upward facing shaping surface until it conforms to said permanent shape and wherein the presence of particles on said shaping surface when said heat-softened sheet comes into contact with said shaping surface causes optical defects in the shaped glass sheet, the improvement comprising applying gas under pressure to said upwardly facing shaping surface at a force sufficient to remove said particles from said shaping surface after said glass sheet has started to sag toward said shaping surface and while said glass sheet is spaced less than half of said sag distance from said shaping surface, said gas being initially applied at a temperature approximating the temperature within the kiln and subsequently at a lower temperature for sufficient time to harden the skin of the sagging glass sheet at its bottom surface without significantly affecting the temperature throughout the rest of the thickness of the glass sheet, and removing said applied gas from between said sagging glass sheet and said shaping surface while said glass sheet sags into conformity with said shaping surface.

4,115,091
METHOD AND APPARATUS FOR MANUFACTURING GLASS RIBBON ON A FLOAT BATH

Robert Bourggraff, Cologne, Fed. Rep. of Germany, and Jean-Claude Coulon, Chalon sur Saone, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 13, 1977, Ser. No. 796,810
Claims priority, application France, May 20, 1976, 76 15202
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A 23 Claims



1. In a method for manufacturing a glass ribbon wherein molten glass is directed onto a bath of molten metal within a protective atmosphere, the molten glass being advanced along the molten metal bath so as to form a congealed glass ribbon, the improvement which comprises,

(a) withdrawing a portion of the molten metal from the molten metal bath, underneath the molten glass, upstream from the location at which the molten glass forms a congealed glass ribbon;

(b) entraining a reducing gas within the withdrawn molten metal;

(c) heating the withdrawn molten metal; and

(d) recycling the withdrawn heated molten metal and reducing gas into the molten metal bath above the surface level of the bath and generally between the location of entry of the molten glass onto the bath and a side region of the bath.

8. In an apparatus for manufacturing a glass ribbon having a tank disposed within a protective atmosphere for containing a bath of molten metal with means for directing molten glass onto the molten metal bath at an upstream location of the tank and means for advancing the molten glass along the tank to form a congealed glass ribbon at a downstream location of the tank and for removing the glass ribbon therefrom, the improvement which comprises,

(a) means for conducting at least a portion of the molten metal from the upstream portion of the tank underneath the molten glass to a side region of the upstream portion of the tank;

(b) means connected to the conducting means for entraining a reducing gas within said conducted molten metal;

(c) means for heating said conducted molten metal,

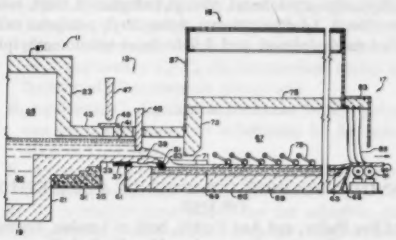
(d) said conducting means comprises a first conduit having a first end passing through a first aperture in the upstream portion of the tank located underneath the molten glass and a second end passing through a second aperture located toward the side of the upstream portion of the tank, said first end terminating below the surface of the molten metal bath; and

(e) wherein the second end of said first conduit terminates above the surface of the molten metal bath.

4,115,092
METHOD AND APPARATUS FOR PREVENTING BUBBLE NUCLEATION AND GROWTH IN A MOLTEN GLASS DELIVERY FACILITY

James Edwin Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,747
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A 7 Claims



1. In an apparatus for delivering molten glass onto a pool of molten tin-containing metal for forming into flat glass which includes a glass-supporting, silica-containing refractory member for supporting molten glass immediately prior to its delivery onto the molten metal which member is contacted by glass and tin, the improvement comprising

a semi-adherent glaze of glass which behaves as a viscous liquid at molten glass delivery temperatures disposed on glass and tin-contacting surfaces of the silica-containing refractory member wherein said glass is disposed on such surfaces prior to first contact by molten glass being delivered thereover.

3. In a method of preparing a flat glassmaking apparatus for use in the manufacture of flat glass by delivering molten glass over a glass-supporting, silica-containing refractory member to a forming chamber onto a glass-supporting surface of a pool of molten tin-containing metal and thereafter cooling and forming the glass into a continuous sheet of glass, wherein the glass-supporting refractory is mounted in place, the forming chamber and refractory are heated to a temperature within range sufficient to provide a pool of the metal in a molten state and for receiving molten glass, providing a protective atmosphere in the forming chamber and initiating the flow of molten glass over the glass-supporting refractory and onto the pool of molten metal; the improvement comprising

establishing on glass and tin-contacting surfaces of the glass-supporting refractory a glaze of glass which becomes viscous at the temperature to which the refractory is heated prior to initiation of molten glass flow; and

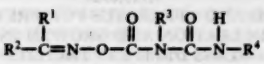
maintaining the temperature of the glass-supporting refractory sufficient during initial molten glass flow to permit a portion of the glaze to slough off from the glass-supporting refractory and be removed by adherence to the molten glass.

4,115,093
CERTAIN OXIMINYL ALLOPHANATES AND THEIR USE AS HERBICIDES

Peter Anthony Bukowick, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 626,524, Oct. 28, 1975, Pat. No. 4,030,912, which is a continuation of Ser. No. 350,218, Apr. 11, 1973, Pat. No. 3,957,867. This application Feb. 3, 1977, Ser. No. 765,176
Int. Cl.[2] A01N *9/00*
U.S. Cl. 71—88 6 Claims

1. A herbicidal composition comprising (1) application aid material and (2) an effective quantity of phytotoxic material comprising a compound of the formula:



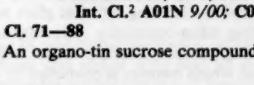
in which when R^1 and R^2 are taken separately, R^1 is selected independently from the group consisting of hydrogen and C_1–C_7 alkyl and R^2 is 2-furanyl; R^3 is selected from the group consisting of C_1–C_7 alkyl, allyl, phenyl, 3-halophenyl and 3,4-dihalophenyl; and R^4 is selected from the group consisting of C_1–C_7 alkyl, allyl, cyclohexyl, phenyl, halophenyl, tolyl, anisolyl, nitrophenyl, 3,4-dihalophenyl, 1-naphthyl, p-toluene sulfonyl, trihalomethylphenyl and 2,6-dinitro-4-trihalomethylphenyl.

4,115,094
ORGANOTIN SUCROSE COMPOUNDS AND METHOD OF USE

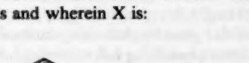
Robert Clive Poller, and Ann Parkin, both of London, England, assignors to Research Corporation, New York, N.Y.

Filed Mar. 22, 1977, Ser. No. 780,053
Int. Cl.[2] A01N 9/00; C07H 23/00
U.S. Cl. 71—88 **27 Claims**

1. An organo-tin sucrose compound of the formula:



in which the tetravalent tin atom has only three tin-carbon bonds and wherein X is:



m is 0 or 1;

p is 0 when *m* is 1 and *p* is 1 when *m* is 0;

n is 0 or an integer from 1 to 6 with the proviso that, when *m* is 1, *n* is an integer from 1 to 6; and

at least two of R^1, R^2 and R^3 are each alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or hydrocarbon aryl or aralkyl of 6 to 10 ring carbon atoms;

when *m* is 1 or when *m* and *n* are both 0, one of R^1, R^2 and R^3 is the acyl radical of an inorganic mineral acid or of a hydrocarbon carboxylic or sulfonic acid of 1–15 carbon atoms; and

when *m* is 0 or when *m* is 1 and *n* is said integer, all of R^1, R^2 and R^3 have the above-indicated values.

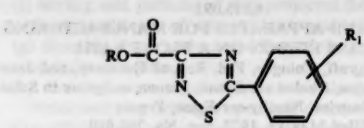
23. A method of inhibiting the growth of plant pests which comprises contacting them with a lethal amount of a compound according to claim 1.

4,115,095
5-ARYL-1,2,4-THIADIAZOLE-3-CARBOXYLATES AND AGRICULTURAL METHODS

John E. Franz, Crestwood, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

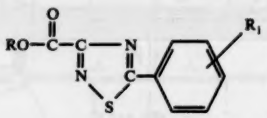
Filed May 23, 1977, Ser. No. 799,811
Int. Cl.[2] A01N 5/00, 9/12, 21/02; C07D 285/10
U.S. Cl. 71—90 **11 Claims**

1. A compound having the formula



wherein R is hydrogen, lower alkyl or agriculturally acceptable cations; R_1 is hydrogen, halogen, trifluoromethyl, cyano, lower alkyl or COOR.

6. A method for reducing or preventing phytotoxic injury by a pre-emergent acetanilide herbicide to desirable plants or crop plants which comprises applying to the desirable plant or crop seed or to the soil in which the seed is planted, a substantially non-phytotoxic safening amount of a compound having the formula



wherein R is hydrogen, lower alkyl or agriculturally acceptable cations; R_1 is hydrogen, halogen, trifluoromethyl, cyano, lower alkyl or COOR.

4,115,096
DIHYDROPYRAZOLONE HERBICIDE

Robert Earl Sticker, Middleport, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 685,741, May 13, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,632
Int. Cl.[2] A01N 9/22; C07D 231/16
U.S. Cl. 71—92 **3 Claims**

1. 2-Cyclohexyl-4-iodo-1,5-dimethyl-1,2-dihydro-3H-pyrazol-3-one.

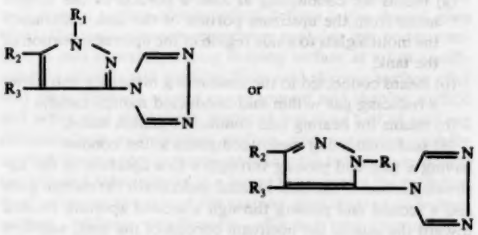
3. A method of controlling undesired plant growth which comprises applying to the locus where control is desired an herbicidally effective amount of the compound of claim 1.

4,115,097
PYRAZOLYLTRIAZOLE HERBICIDES

Stanley Albert Lang, Jr., Pomona, N.Y., and Bryant Leonidas Walworth, Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 619,982, Oct. 6, 1975. This application Apr. 27, 1977, Ser. No. 791,460
Int. Cl.[2] A01N 9/22; C07D 55/06
U.S. Cl. 71—92 **5 Claims**

1. A method for the control of undesirable plant species, comprising contacting the undesirable plant species, seeds or propagules thereof, with a herbicidally effective amount of a compound of the formula:



wherein R_1 is hydrogen, alkyl (C_1–C_3), benzyl, acyl RCO wherein R is C_1–C_3 alkyl or N-alkyl (C_1–C_3) carboxamido; R_2 is hydrogen, methyl or phenyl; R_3 is methyl of

wherein X is hydrogen, halogen, alkyl (C_1–C_3) or CF_3, and the acid addition salt of the compound wherein the acid is HCl, HBr, HI, HNO_3, H_2SO_4, HSO_4^-, $CH_3OSO_2O^-$, H_3PO_4, $HClO_3$, alkanoic (C_2–C_4) acid, benzene sulfonic acid, or p-toluene sulfonic acid.

4,115,098

PEST CONTROL COMPOSITION AND METHOD

Emerson B. Stull, San Antonio, Tex., assignor to Stull Chemical Company, San Antonio, Tex.

Filed May 25, 1977, Ser. No. 800,423

Int. Cl.[2] A01N *9/36, 9/22, 17/00, 17/10*

U.S. Cl. 71—93 **12 Claims**

1. A pest control composition comprising water having suspended therein substantially uniform droplets of from about 50 to 200 microns in diameter of an invert emulsion comprising an external oil system, an internal system comprising water or an oil-in-water emulsion, and at least one pest control agent present in an amount sufficient to control pests, said agent being contained in at least one of said external or internal systems.

4,115,099

ANTIDOTE COMPOSITIONS AND METHOD OF USE WITH HERBICIDES

Duane R. Arneklev, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 742,488, Nov. 17, 1976, which is a continuation of Ser. No. 612,976, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 460,661, Apr. 12, 1975, abandoned, which is a division of Ser. No. 100,770, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 68,529, Aug. 31, 1970, abandoned. This application Apr. 6, 1977, Ser. No. 785,262

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—93 **1 Claim**

1. In the method of controlling weeds wherein an effective herbicidal mixture of a thiolcarbamate herbicide and a triazine herbicide is added to the habitat thereof the improvement comprising adding to the habitat thereof from about 0.01 to about 15 parts by weight for each part by weight of the herbicide an antidote compound represented by the formula

$$Br—CH_2CH_2—O—SO_2—CH_3.$$

4,115,100

SELECTIVE HERBICIDAL COMPOSITION CONTAINING 2-PYRIDINOL COMPOUNDS

Rolf Schurter; Hermann Rempfler, both of Binningen, and Werner Föry, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

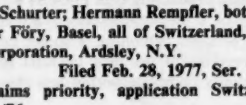
Filed Feb. 28, 1977, Ser. No. 772,796

Claims priority, application Switzerland, Mar. 5, 1976, 2780/76

Int. Cl.[2] A01N *9/22;* **C07D** *213/64*

U.S. Cl. 71—94 **12 Claims**

1. A 2-Pyridinol compound of the formula I



(I)

wherein

A represents an alkylene bridge member having 1–9 C atoms, which can be branched-chain or straight-chain and which can be substituted by halogen;

B represents a group —OR_1 or —SR_2 in which

R_1 represents hydrogen; C_1–C_8 alkyl which is unsubstituted or substituted by halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkoxycarbonyl, C_3–C_{12} cycloalkyl, phenyl which is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano or nitro; C_3–C_{12} cycloalkyl; C_3–C_8 alkenyl which is unsubstituted or substituted by halogen; C_3–C_8 alkynyl; phenyl which is unsubstituted or mono- or poly-substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano or nitro; an ion equivalent of an alkali metal atom; or a quaternary C_1–C_4 alkylammonium group or C_1–C_4 hydroxyalkyl-ammonium group; and

R_2 represents C_1–C_8 alkyl, a phenyl or benzyl group which can be unsubstituted or substituted by halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

R_3 represents C_1–C_4 alkyl or phenyl; and Hal independently represent a chlorine or bromine atom.

11. A herbicidal composition for the selective control of weeds and wild grasses in crops of useful plants, which composition contains as active substance a herbicidally effective amount of a 2-pyridinol compound corresponding to the formula I, claim 1, together with a suitable carrier therefor.

4,115,101

1-ARYL-4-PYRIDONES

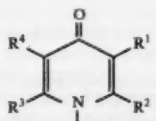
Glenn R. Carlson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 689,219, May 24, 1976, Pat. No. 4,051,142. This application Jul. 15, 1977, Ser. No. 815,971

Int. Cl.[2] A01N *9/22;* **C07D** *213/55, 213/56, 213/57*

U.S. Cl. 71—94 **13 Claims**

1. A method of inducing male sterility in a cereal grain plant which comprises treating the plant prior to meiosis with an amount effective to produce male sterility in the plant of a compound of the formula



wherein

R^1 is a carboxy group or an agronomically-acceptable salt thereof, a carb(C_1–C_4)alkoxy group, a carbamoyl group, a (C_1–C_4)alkyl or di(C_1–C_4)alkyl carbamoyl group, or a cyano group,

R^2 is a (C_1–C_4)alkyl group,

R^3 is a hydrogen atom or a (C_1–C_4)alkyl group,

R^4 is a hydrogen atom, a (C_1–C_4)alkyl group, or a halogen atom, and

R^5 is an unsubstituted phenyl group or a substituted phenyl group having up to three substituents having a total of up to 6 carbon atoms.

4,115,102

PYRIDYL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME AND METHOD OF USE THEREOF

Ryohei Takahashi, Kusatsu; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Yasuhiro Tsujii, Kusatsu, and Nobuyuki Sakashita, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

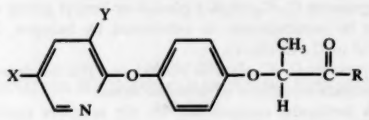
Division of Ser. No. 623,517, Oct. 17, 1975, Pat. No. 4,046,553. This application Jun. 10, 1977, Ser. No. 805,387

Claims priority, application Japan, Oct. 17, 1974, 49-118676; Mar. 13, 1975, 50-29556

Int. Cl.[2] C07D *213/64;* A01N *9/22*

U.S. Cl. 71—94 8 Claims

1. A compound having the formula:



where X is a halogen atom, Y is a hydrogen atom, a halogen atom or a methyl group, and R is a (C_1–C_4) alkylthio group in which the alkyl moiety thereof may be straight or branched chain, or a phenylthio group in which the aryl moiety thereof may be substituted with one or more of a halogen atom or a methyl group.

4,115,103

GERMICIDAL HERBICIDE FOR AGRICULTURE AND HORTICULTURE

Yukio Sugimura, Wakayama; Norioki Miyamoto, Sakura; Tetsuji Iwasaki, Wakayama; Kyozaburo Tachibana, Sakura, and Tsuneyuki Takeno, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

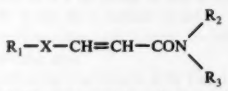
Filed Jun. 16, 1977, Ser. No. 807,148

Claims priority, application Japan, Jun. 30, 1976, 51-77195; Jun. 30, 1976, 51-77196

Int. Cl.[2] A01N *9/12, 9/14*

U.S. Cl. 71—98 6 Claims

1. A method of inhibiting the growth of noxious weeds which comprises applying a herbidically effective amount of at least one compound of the formula:



wherein R_1 represents an alkyl or alkenyl group having 1 to 20 carbon atoms, X represents S, SO or SO_2, and R_2 and R_3 which may be the same or different represent hydrogen, an alkyl group having 1 to 20 carbon atoms, an oxyalkylene group having 1 to 20 units of ethylene oxide or propylene oxide, 2-sulfoethyl or a salt thereof, or 2-carboxyethyl group to plants.

4,115,104

DICYANOVINYLHYDRAZONOMALONONITRILES AND THE HERBICIDAL USE THEREOF

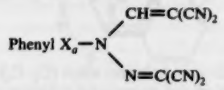
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 14, 1977, Ser. No. 768,137

Int. Cl.[2] C07C *120/00, 121/82, 121/78;* A01N *9/20*

U.S. Cl. 71—105 59 Claims

41. A herbicidal method which comprises contacting a plant with a herbicidally effective amount of a dicyanovinylhydrazonomalononitrile of the formula



wherein each X is a substituent on said Phenyl selected from halogen, alkyl of 1 to 8 carbon atoms, alkoxy or alkylthio or haloalkyl of 1 to 8 carbon atoms, cyano and nitro and wherein *a* is an integer from 0 to 5.

4,115,105

L-2-AMINO-4-(2-AMINOETHOXY)-BUTANOIC ACID

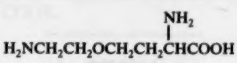
James Parnell Scannell, North Caldwell, and Arthur Stempel, Teaneck, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 629,425, Nov. 6, 1975, abandoned, which is a continuation of Ser. No. 430,373, Jan. 2, 1974, abandoned. This application Aug. 29, 1977, Ser. No. 828,389

Int. Cl.[2] A01N *9/24;* C07C *101/24*

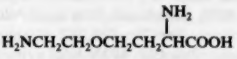
U.S. Cl. 71—113 5 Claims

1. The L -antipode of the compound of the formula



and the pharmaceutically acceptable acid addition salts thereof.

4. A method of increasing the ripening of fruit which comprises the application to said fruit of an effective ethylene enhancing amount of an abscission agent selected from the group consisting of the L-antipode of the compound of the formula



and the pharmaceutically acceptable acid addition salts thereof.

4,115,106

METHOD FOR PRODUCING METALLIC OXIDE COMPOUNDS

Cloyd A. Snavely, Niles, Mich., and John A. Smith, Mishawaka, Ind., assignors to National Standard Company, Niles, Mich.

Filed Oct. 20, 1976, Ser. No. 734,124

Int. Cl.[2] C01G *49/08*

U.S. Cl. 75—0.5 AA 18 Claims

1. A method for producing fine metallic oxides of spinel-type structure comprising the step of reacting beta FeOOH with an aqueous solution of a salt of a substitution-effective metallic cation to yield a ferrite product exhibiting a spinel crystal habitat, wherein the conversion of the beta FeOOH to the ferrite product is substantially complete within less than approximately 40 minutes.

4,115,107

METHOD OF PRODUCING METAL FLAKE

Albert David Booz, New Kensington, and Thomas J. Kondis, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

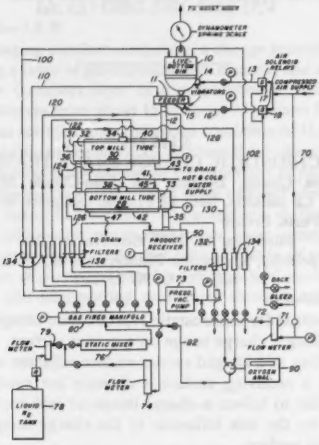
Filed Dec. 14, 1976, Ser. No. 750,504

Int. Cl.[2] B22F *9/00*

U.S. Cl. 75—0.5 R 23 Claims

1. A continuous method of making metal flake in a ball mill comprising the steps of:

(a) feeding a charge of metal particles substantially continuously to a vibratory mill containing milling material;
(b) supplying a controlled amount of lubricant to the mill to avoid formation of agglomerations in amounts which would hinder metal particle flow;
(c) feeding a supply of gas to the mill, the gas feeding being controlled to a rate which avoids substantial interference with metal particle flow through the mill;



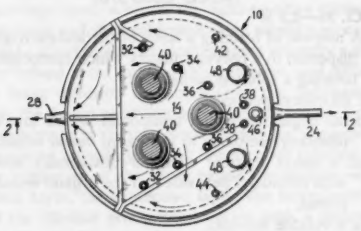
(d) milling the metal particles in the presence of the gas to form metal flake, the milling being controlled so as to substantially eliminate welding of the metal particles;
(e) moving the particles through the mill by use of the vibratory milling action; and
(f) removing metal flake and gas from the mill at a rate substantially commensurate with feed rate.

4,115,108

MATTE SMELTING

Birger Leif Ydstie, Blommenholm, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Dec. 3, 1976, Ser. No. 747,216
Claims priority, application Norway, Dec. 4, 1975, 754091
Int. Cl.[2] C21C *5/52*
U.S. Cl. 75—11 **5 Claims**



1. A matte smelting process for the separation of iron from one or more other metal values said process comprising:
(a) forming a matte phase and a slag phase in the furnace pot of an electric arc furnace, said furnace pot being circular and having a sidewall and a bottom, said bottom being substantially concave and a substantial portion of the concave bottom having a radius of curvature no greater than about the diameter of the furnace pot; and
(b) controlling the operation of the furnace so that the matte phase covers no more than about one-half of the surface of the concave bottom of the circular furnace pot.

4,115,109

SECONDARY LEAD SMELTING PROCESS

Karl David Libsch, Hightstown, and Mannige Vikram Rao, Princeton Junction, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation of Ser. No. 678,954, Apr. 21, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,983
Int. Cl.[2] C22B *13/02*
U.S. Cl. 75—77 **4 Claims**

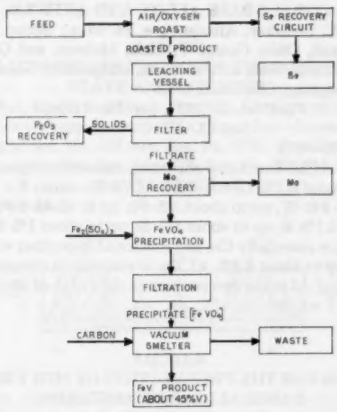
1. In a process for producing lead in a secondary lead smelter which comprises charging said smelter with lead bearing material, carbonaceous material, iron, and fluxes; passing air through said smelter to react with said carbonaceous material to produce carbon monoxide and thereby melt and reduce said lead bearing materials and form molten lead; and removing said molten lead from said smelter, wherein the improvement comprises adding from about 1% to 8% moisture by weight and from about 0.5% to 5% oxygen by weight to said air prior to passing said air through said smelter.

4,115,110

VANADIUM RECOVERY PROCESS

Roman Z. Pyrih, and Robert S. Rickard, both of Golden, Colo., assignors to Earth Sciences, Inc., Golden, Colo.

Filed Apr. 8, 1977, Ser. No. 786,026
Int. Cl.[2] C22B *34/22*; C22C *38/24*; C01G *31/00*
U.S. Cl. 75—101 R **11 Claims**



1. A process for recovering vanadium values from vanadium ore and vanadium scrap such as vanadium bearing catalyst which comprises:
(a) roasting the vanadium ore or vanadium scrap in air at a temperature not in excess of 600° C for a sufficient time to remove substantially all of the carbonaceous material present in the ore or scrap;
(b) roasting the calcine from step (a) in a pure oxygen atmosphere at a temperature of at least about 750° C for a period sufficient to convert substantially all of the vanadium in the calcine to a soluble state;
(c) leaching the calcine from step (b) to a pH from neutral to about 2 in water or a dilute solution of an acid selected from the group consisting of sulfuric, hydrochloric and nitric acids to solubize vanadium values and leave substantially all impurities undissolved;
(d) performing a luquid-solids separation on the leach slurry of Step (c);
(e) precipitating substantially all of the vanadium values

from the filtrate from step (d) with an inorganic iron salt at an acidity no stronger than about pH 1; and

(f) recovering the precipitated vanadium values from step (e) by liquid-solids separation.

9. The process of claim 1 in which the precipitate of step (f) is reduced to produce a ferro-vanadium product.

4,115,111

FREE-CUTTING STRUCTURAL STEEL FOR MACHINES

Tetsuro Itoh, Tokai; Tetsuo Takahashi, Nagoya; Atsuyoshi Kimura, Aichi, and Seiichi Yamano, Tokai, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 523,446, Nov. 13, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 761,954

Claims priority, application Japan, Nov. 13, 1973, 48/127478

Int. Cl.[2] C22C *38/60*

U.S. Cl. 75—128 P **5 Claims**

1. Free-cutting structural steel consisting essentially of 0.05–0.65% carbon, 0.10–0.40% silicon, 0.25–1.70% manganese, 0–4.50% nickel, 0–3.50% chromium, 0–1.0% molybdenum, 0.0002–0.0010% calcium and

at least one element selected from the group consisting of 0.03–0.30% lead and 0.04–0.10% sulfur by weight,

the balance being iron and impurities, together with

30–100 grams of oxide inclusions per ton of steel, said inclusions comprising 40–60% SiO_2, 5–30% CaO and 25–40% Al_2O_3, with less than 20% of other oxides, said inclusions having a melting point of 1,200°–1,600° C.

4,115,112

COBALT-BASE ALLOY AND ARTICLE

Russell W. Smashey, Albuquerque, N. Mex.; Elmer L. Frey, Cincinnati, Ohio; George V. Cash, Melrose, and George S. Irons, Marblehead, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 21, 1977, Ser. No. 817,638

Int. Cl.[2] C22C *19/07*

U.S. Cl. 75—171 **5 Claims**

1. In a cobalt-base alloy consisting essentially, by weight, of at least about 0.2% C, about 24 – 27% Cr, about 9 – 12% Ni, about 7 – 8% W, up to about 2% Fe, up to about 0.3% Zr, up to about 0.1% B, up to about 1% Si, up to about 1% Mn, with the balance essentially Co, and incidental impurities which can include up to about 0.4% Al, the improvement comprising the inclusion of Al in the composition in the range of about 0.7 up to about 2 wt. %.

4,115,113

PROCESS FOR THE PREPARATION OF MOLYBDENUM BASED ALLOYS BY SINTERING

Geraud Fustier, Bonneville; Jean-Paul Langeron, Malabry; Joseph de la Bastie, and Jean Carlizza, both of Le Fayet, all of France, assignors to Cime Bocuze, Paris, France

Filed Apr. 23, 1976, Ser. No. 679,852

Claims priority, application France, Apr. 23, 1975, 75 13488

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] B22F *1/100*

U.S. Cl. 75—206 **4 Claims**

1. A process for the preparation of molybdenum based alloys containing titanium and zirconium as reinforcing elements, comprising

(a) introducing isopropyl titanate and zirconyl nitrate, as addition compounds, in solution form, at least one of which is dissolved in an organic solvent, into molybdenum used in the form of metallic molybdenum or ammonium decamolybdate,

(b) reducing the mixture of isopropyl titanate, zirconyl nitrate and metallic molybdenum or ammonium decamolybdate with hydrogen, whereby the ammonium decamolybdate is reduced to the metallic state of molybdenum, and the isopropyl titanate and zirconyl nitrate are converted to TiO_2 and ZrO_2, respectively,

(c) adding and mixing carbon in sufficient quantity and at a temperature at which said carbon partially reduces the addition compound,

(d) compressing the so-reduced mixture into briquettes, under a pressure of about 1000 bars, and

(e) sintering, whereby the titanium is dissolved and the zirconium appears as a finely dispersed phase.

4,115,114

ELECTROSTATIC CHARGE IMAGE TRANSFER

Pham Kim Quang, Dieppe, and Jean-Claude Marckmann, Arques La Bataille, both of France, assignors to La Cellophane, Paris, France

Filed Sep. 14, 1973, Ser. No. 397,360

Claims priority, application France, Sep. 21, 1972, 72 33401

Int. Cl.[2] G03G *13/044*

U.S. Cl. 96—1.4 **5 Claims**

1. A method for electrostatic reproduction comprising

establishing a charge image on a carrier surface,

associating said imaged carrier surface adjacent and spaced from a receiving surface a distance not exceeding 250 microns to induce a charge image on said receiving surface by the sole influence of the charge image on said carrier surface,

presenting a charged developer between said associated spaced surfaces to pigment said images,

maintaining a spaced relationship of said carrier and receiving surfaces, and

thereafter fixing one of said images.

4,115,115

CRYSTALLIZATION OF SELENIUM IN POLYMER MATRICES VIA IN SITU GENERATION OF ORGANIC CRYSTALLINE NUCLEATION SITES

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1977, Ser. No. 836,166

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 R **7 Claims**

1. A method of forming a layer of particulate trigonal selenium dispersed in a polymer matrix which comprises:

(a) forming a solution containing:

i. dibenzoyl peroxide,

ii. an organo selenium compound which interacts with dibenzoyl peroxide to form zero valent selenium, and

iii. a matrix polymer which is substantially non-reactive with dibenzoyl peroxide and the organo selenium compound,

in a volatile solvent;

(b) applying the solution to a substrate in the form of a thin film;

(c) allowing the dibenzoyl peroxide and organo selenium compound to react thereby forming amorphous zero valent selenium particles dispersed in the matrix polymer; and

(d) heating the matrix polymer/zero valent selenium combination to a temperature and for a time sufficient to convert the amorphous zero valent selenium to its crystalline, trigonal form.

4,115,116

IMAGING MEMBER HAVING A POLYCARBONATE-BIPHENYL DIAMINE CHARGE TRANSPORT LAYER

Milan Stolka; Damodar M. Pai, both of Fairport, and John F. Yanus, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 673,237, Apr. 2, 1976, abandoned. This application May 4, 1977, Ser. No. 793,666
Int. Cl.[2] G03G 5/06, 5/04, 5/14
U.S. Cl. 96—1.5 R 6 Claims

1. An imaging member comprising a charge generation layer comprising a layer of photoconductive material and a contiguous charge transport layer of a polycarbonate resin having dispersed therein from about 15 to about 75 percent by weight of a material selected from the group consisting of N,N'-diphenyl-N,N'-bis(phenylmethyl)-[1,1'-biphenyl]-4,4'-diamine, said photoconductive layer exhibiting the capability of photogeneration of holes and injection of said holes and said charge transport layer being substantially non-absorbing in the spectral region at which the photoconductive layer generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said charge transport layer.

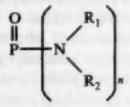
4,115,117

COLOR DIFFUSION TRANSFER PROCESS EMPLOYING PHOSPHORAMIDES

Jiro Takahashi; Akihiko Miyamoto; Tooru Aoki; Naoshi Kunieda, and Kuniaki Tanisawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,302
Claims priority, application Japan, Nov. 7, 1975, 50-134569; Apr. 16, 1976, 51-43213
Int. Cl.[2] G03C 7/00, 5/54, 1/40
U.S. Cl. 96—29 D 12 Claims

1. In a process for forming a dye image in an image-receiving layer of a film unit containing a light-sensitive element and an image-receiving element, the light-sensitive element having a silver halide emulsion layer in combination with a diffusible dye image forming substance, an intermediate layer and a protective layer, the image-receiving element containing an image-receiving layer, wherein the light-sensitive element is exposed to light and then subjected to an alkaline processing solution and a silver halide developing agent whereby a diffusible dye is formed in the light-sensitive element, said diffusible dye then being diffusion transfered from the light-sensitive element to the image-receiving layer superposed thereon to form the dye image in the image-receiving layer, the improvement comprising providing at least one member selected from the group consisting of the silver halide emulsion layer, the intermediate layer, the protective layer, the image-receiving layer and the alkaline processing solution with a compound represented by the formula;



wherein R_1 and R_2 individually represent lower alkyl, and n is 3.

4,115,118

PROCESS FOR PRODUCTION OF PRINTING PLATE

Kikuo Kubotera; Akira Kashiwabara, and Kotaro Sato, all of Osaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation of Ser. No. 546,173, Jan. 31, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,495
Claims priority, application Japan, Jan. 31, 1974, 49-13211
Int. Cl.[2] G03F 7/02
U.S. Cl. 96—33 7 Claims

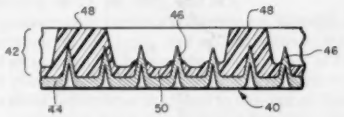
1. A sequential process for producing a printing plate which comprises imagewise exposing a light-sensitive material comprising a support with a hydrophilic surface and having thereon an unhardened silver halide emulsion layer on said support, then developing said light-sensitive material with a non-tanning developer, then fogging the remaining silver halide which did not receive said imagewise exposure by exposing said remaining silver halide to radiation, then developing said remaining silver halide with a tanning developer and, at the same time, hardening said emulsion layer at said remaining silver halide areas, and then removing the unhardened emulsion layer with hot water, whereby an oleophilic hardened relief image is formed.

4,115,119

SHALLOW RELIEF PHOTOPOLYMER PRINTING PLATE AND METHODS

Sakuo Okai, Kyoto, and Shozo Tsuchida, Osaka, both of Japan, assignors to Napp Systems (USA), Inc., San Marcos, Calif.

Division of Ser. No. 695,941, Jun. 14, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,974
Int. Cl.[2] G03C 5/00
U.S. Cl. 96—35.1 5 Claims



1. In the development of a shallow relief water-developable photopolymer printing plate containing a water-developable photopolymer layer having a thickness less than about 0.020 inch wherein said plate is subjected to a primary imagewise exposure to actinic light, thereafter washed to remove soluble photopolymer and dried, an improved method of generating a controlled array of protrudent dots in the recessed background areas of said plate comprising:

exposing said plate to actinic light through a screen dot negative prior to said washing step in a manner to polymerize a controlled array of small, discreet portions of the photopolymer throughout the entire area of said plate, thereby providing upon subsequent development of the plate a plurality of spaced protrudent dots in the background areas of said plate which would otherwise be removed in said washing step, said array of protrudent dots having a density in the range of about 50 to 2000 dots per square centimeter, transverse dimensions in the range of about 0.001 to 0.006 inch per dot and a height about 0.004 inch less than the height of the relief image areas of said developed plate.

4,115,120
METHOD OF FORMING THIN FILM PATTERNS BY DIFFERENTIAL PRE-BAKING OF RESIST

Donald R. Dyer, Wappingers Falls; Claude Johnson, Jr., Yorktown Heights, and Robert R. Wilbarg, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,675
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—36.2 **6 Claims**

1. A method of depositing patterned thin films on a substrate comprising:

forming a layer of positive photoresist material on said substrate,

heating to partially cure said photoresist while maintaining the surface of said photoresist layer interfacing with said substrate at a lower temperature than the opposite surface of said layer,

exposing said photoresist layer to a selected pattern of light,

applying developer for said photoresist material to said layer to thereby form an aperture pattern through said layer corresponding to said light pattern wherein said apertures are respectively narrower at said opposite surface than at said interface, and

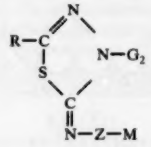
depositing said thin films onto said substrate through said apertures using said photoresist mask as a deposition mask.

4,115,121
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING YELLOW COUPLER

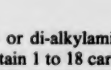
Graham Evans, Chelmsford, England; Mario Fryberg, Praroman-le-Mouret; Thomas Stauner, Maryl, both of Switzerland; Paul Tschopp, Dudingen, and David G. Leppard, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed Mar. 30, 1977, Ser. No. 782,798
Claims priority, application Switzerland, Apr. 14, 1976, 4751/76
Int. Cl.[2] G03C *7/00, 1/40*
U.S. Cl. 96—56.3 **11 Claims**

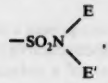
1. Colour photographic material which comprises at least one silver halide emulsion layer containing, as the yellow coupler, a compound of the formula



in which G_2 is a benzoylacetanilide or pivaloylacetanilide radical which is bonded to the heterocyclic ring by means of the active methylene group, Z is —CO— or $—SO_2—$, M is alkyl with 1 to 18 carbon atoms, optionally substituted by halogen, hydroxyl, nitro, cyano, alkoxy, aryloxy or amino; aralkyl, cycloalkyl with 1 to 4 cycloalkyl rings, phenyl, optionally substituted by lower alkyl or lower alkoxy, halogen, acylamino, sulphonic acid groups, sulphonic acid amide groups, carboxylic acid groups, carboxylic acid amide groups, carboxylic acid ester groups, hydroxyl, nitro, cyano, amino, mercapto, alkylmercapto or $—SO_2W$ or —COW, in which W is alkyl with 1 to 18 carbon atoms, optionally substituted by halogen, nitro, cyano, amino or alkoxy with 1 to 18 carbon atoms; cycloalkyl, aryl, pyridyl, pyrimidyl, furyl or thienyl; M is also pyridyl, furyl, thienyl or perfluoroalkyl, acyl or dialkylamino with, in each case, up to 5 carbon atoms in the alkyl part; alkoxy with 1 to 18 carbon atoms or phenoxy; 1) M is further hydrogen, when Z is —CO—, and R is hydrogen or alkyl with 1 to 18 carbon atoms, aralkyl, aryl, pyridyl, pyrimidyl, furyl, thienyl, cycloalkyl, alkoxy with 1 to 18 carbon atoms, aryloxy, alkylmercapto with 1 to 18 carbon atoms, arylmercapto, halogen, acyl, acyloxyalkyl, trifluoromethyl, cyano, a primary amino group, a mono- or di-alkylamino group, in which the alkyl radicals each contain 1 to 18 carbon atoms, or one of the groups M—Z—HN—, W—CO—,



$W—SO_2—$, $—SO_2NH_2$,



W—CO—O— or W—O—CO—, in which E is alkyl with 1 to 5 carbon atoms, E′ is hydrogen or alkyl with 1 to 5 carbon atoms and M, W and Z have the indicated meanings.

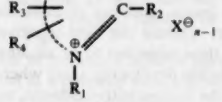
11. Process for the production of a yellow image, wherein material for colour photography which contains on a support at least one layer of silver halide emulsion containing as the yellow coupler at least one compound according to claim 1, is exposed and the exposed material is treated with an aqueous alkaline solution which contains an aromatic amine as the developer.

4,115,122
INTERNAL LATENT IMAGE SILVER HALIDE EMULSION CONTAINING A HETEROCYCLIC QUATERNARY SALT HAVING A PROPARGYL OR A BUTYRYL CONTAINING SUBSTITUENT

Keiichi Adachi; Tadashi Ikeda, and Nobuyuki Tsujino, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Dec. 9, 1976, Ser. No. 748,858
Claims priority, application Japan, Dec. 9, 1975, 50-146569
Int. Cl.[2] G03C *1/48, 1/06*
U.S. Cl. 96—76 R **24 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer of the internal latent image type which is capable of forming a direct positive image, in which at least one hydrophilic colloid layer thereof contains at least one heterocyclic quaternary salt compound represented by the following general formula (I)



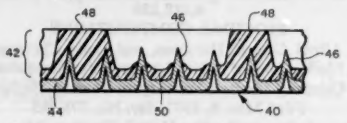
(I)

wherein Z represent an atomic group necessary for forming a thiazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a benzoselenazole nucleus, an oxazole nucleus, a benzoxazole nucleus, a naphthoxazole nucelus, a benzimidazole nucleus, a pyridine nucleus, a quinoline nucleus or an indolenine nucelus, R_1 represents an aliphatic hydrocarbon group, R_2 represents a hydrogen atom or an aliphatic hydrocarbon group, R_3 and R_4, which are the same or different, each represents a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group, an alkoxy group, a hydroxy group or an aromatic hydrocarbon group, and at least one of R_1, R_2, R_3 and R_4 represents a propargyl group, a butynyl group, a propargyloxymethyl group, a propargyloxyethyl group or a propargyloxy group, $X^{\ominus}$ represents an anion, and n is 1 or 2, with n being 1 when the compound forms an inner salt; in such an amount as to exert a fogging effect on the silver halide emulsion of the internal latent image type during development.

4,115,123
SHALLOW RELIEF PHOTOPOLYMER PRINTING PLATE AND METHODS

Sakuo Okai, Kyoto, and Shozo Tsuchida, Osaka, both of Japan, assignors to Napp Systems (USA), Inc., San Marcos, Calif.

Division of Ser. No. 695,941, Jun. 14, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,975
Int. Cl.² G03C *1/68*
U.S. Cl. 96—79 **16 Claims**



1. A photopolymerizable element comprising a laminate of photosensitive composition supported on a substrate; said laminate including a first photopolymerizable layer adjacent said substrate and a second photopolymerizable layer disposed over said first layer; and said first layer including an array of preopolymerized portions distributed throughout substantially its entire area sufficient upon subsequent exposure and development of said photopolymeriable element to create a corresponding array of protrudent dots in the recessed background areas of the developed element, said protrudent dots having a height less than the height of the raised image areas of the developed element and a density sufficient to reduce the amount of bottoming in the developed element.

8. A photopolymerizable element comprising a laminate of photosensitive composition having a thickness less than about 0.020 inch and supported on a substrate; said laminate including a first photopoymerizable layer adjacent to said substrate and a second photopolymerizable layer disposed over said first layer; and said first layer including an array of prepolymerized portions throughout substantially its entire area, said array having a density in the range of from about 100 to about 2000 per square centimeter and being sufficient upon subsequent exposure and development of said photopolymerizable element to create a corresponding array of protrudent dots in the recessed background areas of the developed element, each of said protrudent dots having a transverse dimension less than about 0.008 inch and a height about 0.004 inch less than the height of the raised image areas of the developed element.

4,115,124
METHOD OF IMMOBILIZING OPTICAL BRIGHTENERS

Lewis R. Hamilton, and Richard C. Sutton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1974, Ser. No. 503,816
Int. Cl.² G03C *1/92, 1/94*
U.S. Cl. 96—82 **25 Claims**

1. A photographic element comprising a support, at least one light sensitive emulsion layer, at least one layer containing an anionic water-soluble fluorescent optical brightener and a layer containing a polymer containing at least 80% by weight of poly(vinyl imidazole) or poly(vinyl imidazole) substituted with alkyl or aryl.

4,115,125
POLYMERIC FILMS PEELABLY ADHERED TO A PRESSURE-SENSITIVE ADHESIVE PHOTOGRAPHIC ELEMENT

Doyle O. Etter, and Irvin H. Crawford, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1977, Ser. No. 794,857
Int. Cl.² G03C *1/86*
U.S. Cl. 96—83 **8 Claims**

1. A photographic element comprising a paper support, an imaging layer on one surface of said support, a pressure-sensitive adhesive layer bonded to the opposite surface of said support, and a layer of an ethylene polymer peelably adhered to said adhesive layer, said polymer layer having been formed by extruding molten ethylene polymer having a melt index in the range from about 3 to 14 and a temperature above 450° F onto said adhesive layer on said support, the bond strength between said polymer layer and said pressure-sensitive adhesive layer being such that a force not exceeding 400 grams will peel a strip of said polymer layer ½ inches wide and at least 10 inches long from said adhesive layer at room temperature at a rate of 10 inches per minute after said element is room temperature aged for at least 15 days after extrusion.

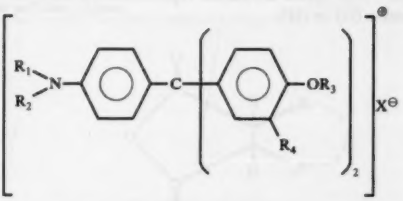
2. A photographic element as described in claim 1 wherein said temperature is in the range from about 490° to 600° F.

4,115,126
MAGENTA TRIPHENYLMETHANE ANTIHALATION DYES FOR PHOTOGRAPHIC ELEMENTS

George Crosier Whitney, III, Fair Haven, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1977, Ser. No. 766,421
Int. Cl.² G03C *1/84;* C09B *11/14*
U.S. Cl. 96—84 R **7 Claims**

1. A magenta dye of the formula



where R_1 and R_2 are each C_1 to C_5 alkyl, 2-cyanoethyl, or 2-chloro-ethyl;

wherein R_3 is a C_1–C_4 alkyl group or $—(CH_2)n—CO_2H$; and R_4 is hydrogen when R_3 is $—(CH_2)_n—CO_2H$, and is $—(CH_2)_n—CO_2H$ when R_3 is C_1–C_4 alkyl;

n is an integer from 1–4;

and X^- is a salt-forming anion selected from the group consisting of Cl, Br, NO_3, and SO_4.

4. A photographic element comprising a support, a photosensitive silver halide layer, and an antihalation layer composed of an organic binder and the magenta dye of claim 1.

7. The photographic element of claim 4 wherein the photosensitive silver halide layer is affixed to one side of the support, and the antihalation layer is positioned between the support and the silver halide layer.

4,115,127
PROCESSING-FREE TYPE LITHOGRAPHIC PRINTING PLATE MATERIAL

Tomoaki Ikeda; Yuzo Mizobuchi; Akira Nahara; Yasuo Washizawa; Yoshihiro Ono, and Takeshi Tomotsu, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 562,385, Mar. 26, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,699
Claims priority, application Japan, Mar. 26, 1974, 49-33790
Int. Cl.² G03C *1/86, 1/78;* G03F *7/02;* G03C *5/00*
U.S. Cl. 96—85 **18 Claims**

1. A processing-free lithographic printing plate, which comprises a support having deposited thereon a composition containing germanium and sulfur and at least one of a metal or a metal compound other than germanium in a physically mixed state, the term "physically mixed state" meaning the state where both ingredients do not form complete films or layers on said support in a superposed disposition but the microscopic condition in which there are areas where the surface of the

support is uncovered, areas of the composition containing germanium and sulfur, areas of a metal or a metal compound, and areas where the composition containing germanium and sulfur and a metal or metal compound are super-imposedly deposited, on the surface of the support.

4,115,128

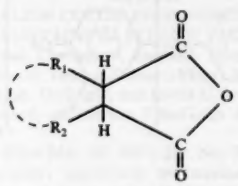
POSITIVE IMAGE FORMING RADIATION SENSITIVE COMPOSITIONS CONTAINING DIAZIDE COMPOUND AND ORGANIC CYCLIC ANHYDRIDE

Nobuyuki Kita, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

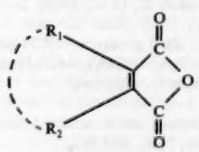
Filed Dec. 17, 1976, Ser. No. 751,875
Claims priority, application Japan, Dec. 26, 1975, 51-156662
Int. Cl.² G03C *1/60*
U.S. Cl. 96—91 D **6 Claims**

1. A radiation-sensitive composition capable of producing a positive image upon exposure to actinic radiation and subsequent treatment with a basic solution which consists essentially of, by weight based on weight of the total composition, (a) 10 to 50 weight percent of an o-naphthoquinone diazide compound, (b) 45 to 79 weight percent of an alkali soluble film-forming phenolic resin and (c) 1 to 15 weight percent of an organic acid cyclic anhydride represented by the following formulae (II) or (III)

(II)



(III)



wherein R_1 and R_2 each represents a hydrogen atom, a halogen atom, an unsubstituted or substituted alkyl group, or an unsubstituted or substituted aryl group, and R_1 and R_2 may combine together to form a cyclic ring.

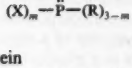
4,115,129

ORGANOPHOSPHINE SULFIDES AS PHOTOGRAPHIC SENSITIZERS

John Howard Bigelow, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

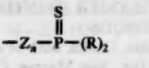
Continuation of Ser. No. 618,694, Oct. 1, 1975, abandoned. This application Oct. 28, 1977, Ser. No. 847,006
Int. Cl.² G03C *1/28*
U.S. Cl. 96—107 **35 Claims**

1. A photographic silver halide emulsion sensitized by digestion at a pH of at least 7 with an organophosphine sulfide added before or during digestion and having the formula



wherein

(A) R is individually selected from hydrogen and a monovalent organic radical; *m* is 0, 1 or 2, and not more than one of said R's is hydrogen when *m* is 0; and X represents a group having the formula:



where Z is a divalent organic radical, and *n* is 0 or 1, or

(B) $(X)_m$ and $(R)_{3-m}$ together comprise a single trivalent heterocyclic radical.

4,115,130

BIOCIDAL COMPOSITIONS

Ronald Alfred Crump, Horsham, and Colin Christopher McCain, Horley, both of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Mar. 9, 1977, Ser. No. 775,895
Claims priority, application United Kingdom, Mar. 15, 1976, 10244/76
Int. Cl.² C09D *5/16*
U.S. Cl. 106—15 R **9 Claims**

1. A biocidal composition, suitable for use in marine anti-fouling coatings, comprising particles of a water-insoluble mineral having an internal pore structure and, included within the pores, a biocidal compound effective against marine growth, said water-insoluble mineral selected from the group consisting of zeolites and silicas, said silicas having an average pore diameter of from 10 to 250Å and said biocidal compound being an organo-tin compound of general formula

$$R_3SnX$$

where *R* is a hydrocarbyl group with from 1 to 10 carbon atoms and *X* is an anion.

4,115,131

OPTICAL GLASS

Kazufumi Ishibashi, Sagamihara, and Takeo Ichimura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 27, 1977, Ser. No. 791,182
Claims priority, application Japan, Apr. 30, 1976, 51-48474
Int. Cl.² C03C *3/16, 3/14*
U.S. Cl. 106—47 Q **11 Claims**

1. An optical glass composition having a refractive index from 1.57 to 1.98 and Abbe number from 18 to 46, said composition consisting essentially of, by weight, 1 to 25% B_2O_3, 20 to 50% P_2O_5, and 22 to 70% Nb_2O_5.

4,115,132

SEALING COMPOSITION

Yoshiro Suzuki; Yoshinori Kokubu, both of Tokyo; Jiro Chiba, Yokohama; Morihisa Hara, Tokyo; Shigehiro Nagahara, and Koichi Yamamoto, both of Funabashi, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 2, 1977, Ser. No. 847,928
Claims priority, application Japan, Nov. 9, 1976, 51-133822
Int. Cl.² C03C *3/12*
U.S. Cl. 106—53 **4 Claims**

1. A sealing composition consisting essentially of, in weight %:

low melting devitrifiable glass powder	86.5 – 95
lead titanate powder	5 – 15
Zircon powder	0 – 0.5

wherein said low melting devitrifiable glass powder has a composition consisting essentially of, in weight %:

PbO	77 – 83
B_2O_3	7 – 10
ZnO	7 – 12

-continued

SiO_2	1 - 3

and wherein said sealing composition can achieve a seal of matched expansion type to a material having a thermal expansion coefficient of 95-105 $\times$ 10^{-7}° C.$^{-1}$ (0°-300° C.) at a devitrified state by a heat-treatment at a temperature not higher than 420° C. within a period of 60 minutes.

3. A sealing composition consisting essentially of, in weight %:

low melting devitrifiable glass powder	69.5 - 85
lead titanate	15 - 30
Zircon powder	0 - 0.5

wherein said low low melting devitrifiable glass powder has a composition consisting essentially of, in weight %:

PbO	77 - 83
B_2O_3	7 - 10
ZnO	7 - 12
SiO_2	1 - 3

and wherein said sealing composition can achieve a seal of non-matched expansion type to a material having a thermal expansion coefficient of 95-105 $\times$ 10^{-7}° C.$^{-1}$ (0°-300° C.) at a devitrified state by a heat-treatment at a temperature not higher than 420° C. within a period of 60 minutes.

4,115,133

UNBURNT REFRACTORY MASSES OR BRICKS FOR METALLURGICAL VESSELS BASED ON CHROME-ORE AND CARBON-CONTAINING BINDER

Rudolf Kunkele, Mulheim, and Hans-Peter Engelhardt, Krefeld, both of Germany, assignors to Magnesital-Feuerfest GmbH, Germany

Filed Aug. 24, 1977, Ser. No. 827,407

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638458

Int. Cl.^{2} C04B *35/52, 35/12, 35/42*

U.S. Cl. 106—56 **8 Claims**

1. An unburnt refractory mass consisting essentially of:

75 to 85% by weight of chrome ore having a Cr_2O_3 content of at least 33 weight percent;

10 to 19% by weight of sintered magnesia poor in iron content;

2 to 7 weight percent hard pitch combined with 1.5 to 5 weight percent carbon to provide a residual carbon of 3 to 6%.

4,115,134

TRANSPARENT YTTRIA CERAMICS AND METHOD FOR PRODUCING SAME

William H. Rhodes, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 11, 1977, Ser. No. 814,341

Int. Cl.^{2} C04B *35/50*

U.S. Cl. 106—73.2 **2 Claims**

1. An article of manufacture comprising a substantially transparent, high density polycrystalline yttria-based body which is thermodynamically more stable in the environment of a high-pressure sodium vapor lamp than yttria doped with +4 valence ions, consisting essentially of yttria and from about 6 to 14 mole percent lanthana.

4,115,135

COMPOSITION AND METHOD FOR PRODUCING GLASS REINFORCED CEMENT PRODUCTS

Friedrich Goeman, Stone Mountain, Ga., assignor to W. R. Bonsal Company, Lilesville, N.C.

Continuation-in-part of Ser. No. 705,884, Jul. 16, 1976. This application Sep. 9, 1977, Ser. No. 832,013

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—99 **13 Claims**

13. A cement mix suitable for mixing with water to form a glass reinforced cementitious material for use in high tensile strength applications such as surface bonding of concrete blocks or the like or in the formation of concrete products, and characterized by providing a resistance to degradation of the glass reinforcement by the alkaline environment of the cementitious material, said cement mix consisting essentially of:

	parts by weight
Portland cement	100
hydrated lime	13-22
fine sand aggregate	100-160
chopped glass fiber reinforcement	4-7
admixtures	1-20
water soluble salt selected from the group consisting of barium chloride, lithium carbonate and zinc acetate	.5-3

4,115,136

METHOD OF HEAT TREATING RAW MATERIALS AND ROTARY KILN PLANT THEREFOR

Dan S. Hansen, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,807

Claims priority, application United Kingdom, Apr. 4, 1975, 13889/75

Int. Cl.^{2} C04B *7/44*

U.S. Cl. 106—100 **4 Claims**

1. A method of burning cement raw meal containing alkaline substances in a rotary kiln plant wherein the kiln exhaust gases contain dust particles and alkali vapours, comprising:

(a) introducing the cement raw meal into the material inlet end portion of the rotary kiln;

(b) burning the cement raw meal in the kiln;

(c) directing the kiln exhaust gases into a generally circular chamber communicating directly with the material inlet end portion of the kiln;

(d) introducing relatively cold atmospheric air generally tangentially into the chamber in a manner to produce a circulating stream of relatively cold air generally about the stream of exhaust gases passing therethrough from the kiln whereby at least portions of the exhaust gases are cooled and alkali vapours are condensed out of the gases and onto dust particles entrained therein; and

(e) permitting the alkali coated dust particles to be discharged from the chamber.

4,115,137

METHOD OF PRODUCING CEMENT CLINKER FROM CHLORINE-CONTAINING RAW MIXTURE

Boris Izrailovich Nudelman, Chilanzar, kvartal 8, 27, kv. 48; Valentina Petrovna Sharova, Chilanzar, kvartal 11, 18, kv. 53; Grant Leonidovich Ter-Aganov, Kara-Kamysh, 2/4, 12, kv. 22; Lev Matveevich Sosenko, Chilanzar, kvartal 23, 69, kv. 4; Marsel Yanovich Bikbau, Junus-Abad B-2, 21, kv. 58, all of Tashkent; Vadim Alexandrovich Kulabukhov, Otkrytoe shosse, ulitsa 4 Armii, 29, korpus 11, kv. 46, Moscow; Valentin Vasilievich Sheludko, ulitsa 43 Armii, 7, kv. 68, Podolsk Moskovskoi oblasti; Ida Timofeevna Uvarova-Nistratova, ulitsa Vrevskaya, proezd 2, 11, Tashkent; Albert Pavlovich Simon, ulitsa Taneeva, 33, kv. 29, Tashkent; Boris Abramovich Perlin, Khamzinsky raion, ulitsa Koldirgach, 5, Tashkent; Mikhail Gavrilovich Chepkalenko, Tashavtomash, 2,22, kv. 24, Tashkent; Alevtina Anatolievna Gasanova, Chilanzar, kvartal 22, 1, kv. 24, Tashkent; Guzal Abdulkhaevna Galimova, Volgogradskaya ulitsa, 1, kv. 10, Tashkent; Rashida Gafievna Bodyagina, ulitsa Sh.Rustaveli, 43, kv. 52, Tashkent; Arnold Arnoldovich Kevvai, ulitsa Kara-Kamysh, 1/3, 51, kv. 42, Tashkent; Boris Samuilovich Albats, prospekt Vernadskogo, 117, kv. 28, Moscow, and Gennady Andreevich Babin, ulitsa Vasilievskaya, 3, kv. 37, Moscow, all of U.S.S.R.

Filed May 13, 1977, Ser. No. 796,666

Int. Cl.[2] C04B 7/48

U.S. Cl. 106—100 **24 Claims**

1. In a method of producing cement clinker from a chlorine-containing raw mixture, wherein a cement clinker raw mixture including chlorine containing compounds is introduced into a kiln and is sintered in said kiln forming a sinter layer and thereafter producing said clinker, the steps comprising

after sintering said raw mixture introducing a steam-gas-and-air mixture into said kiln into contact with said sinter layer, at such a rate as to suspend said sinter layer in said steam-gas-and-air mixture and to remove chlorine-containing compounds from said sinter by thermal decomposition,

regenerating said chlorine-containing compounds by spraying the raw mixture used to produce said clinker prior to sintering in a stream of chlorine-containing flue gases and

after treatment with said steam-gas-and-air mixture, cooling the resultant clinker.

4,115,138

RAW MIXTURE FOR THE PRODUCTION OF CEMENT

Boris Izrailovich Nudelman, Chilanzar, kvartal 8, 27, kv. 48; Alexandr Sergeevich Sventsitsky, Severo-Vostok, 50, kv. 64; Marsel Yanovich Bikbau, Massiv Junus-Abad B-2, 21, kv. 58; Isaak Mozesovich Bun, Chilanzar, kvartal 8, 6a, kv. 19, and Arnold Arnoldovich Kevvai, Massiv Kara-Kamysh 1/3, 51, kv. 42, all of Tashkent, U.S.S.R.

Filed May 23, 1977, Ser. No. 799,767

Int. Cl.[2] C04B 7/02

U.S. Cl. 106—100 **5 Claims**

1. A raw mixture for the production of cement consisting of calcareous, silicaceous, aluminous, ferrous and magnesium-containing components and calcium chloride contained in the raw mixture in the following proportions, percent by weight:

calcareous component calulated per CaO	30 to 42.3
silicaceous component calculated for SiO_2	12.5 to 17.5
aluminous component calculated for Al_2O_3	1.6 to 12.4
ferrous component calculated for Fe_2O_3	0.6 to 4.4
magnesium-containing component calculated for MgO	1.5 to 8
calcium chloride	6 to 20
losses at calcination	the balance.

4,115,139

PRODUCTION OF RAW MIX CEMENT SLURRIES HAVING REDUCED WATER CONTENT

Richard L. Every, Barrington, and Jose T. Jacob, Lake Zurich, both of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Jan. 16, 1978, Ser. No. 869,993

Int. Cl.[2] C04B 7/38

U.S. Cl. 106—100 **5 Claims**

1. A process for the production of a raw mix cement slurry which comprises adding thereto an effective amount of lignin carboxylic acid of average molecular weight 1000–80,000 and having the formula

$$\text{Lignin} - (0)_n - (CH_2)_x\,COOR$$

in which $n = 0$–1, x is 1–4 and R is selected from the group consisting of H, methyl, ethyl, Na, and K; thereby to reduce the water content of the slurry and to conserve the amount of fuel required to evaporate water from the slurry during burning; said effective amount being within the range of about 100–10,000 ppm based on the total weight of the slurry.

4,115,140

LIME SILICIC ACID MIXTURES AND METHODS OF MAKING BUILDING MATERIALS THEREFROM

Dieter Hums, Schrobenhausen; Friedrich Hergeth, and Werner Wetzig, both of Messel, all of Germany, assignors to Intong AB, Fack, Sweden

Filed Jan. 17, 1977, Ser. No. 759,731

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601683

Int. Cl.[2] C04B 7/34

U.S. Cl. 106—120 **7 Claims**

1. In a cellular concrete manufactured from a mixture comprising water, at least one SiO_2-containing component as a base material, at least one CaO-containing component as a binding agent, and small quantities of an expanding agent for providing pores in a mass formed when said water, said SiO_2-containing and CaO-containing components are mixed together, the weight ratio of SiO_2-components to CaO-components being between 90 to 10 and 65 to 35, said mass being steam-cured at elevated temperature and pressure in order to grant final strength to the cellular concrete, the improvement comprising including in said mixture about 0.5 to 10% by weight, based on the total weight of said substances, a silicic acid additive comprising chemically precipitated silicic acid containing about 1 to 8% by weight, hydrated AlF_3 as an impurity.

4,115,141

PROCESS FOR THE PREPARATION OF PIGMENTARY BRIGHT PRIMROSE YELLOW BISMUTH VANADATE

Douglas Howard Piltingsrud, Waverly, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 698,694, Jun. 22, 1976, abandoned. This application May 9, 1977, Ser. No. 794,392

Int. Cl.[2] C09C 1/00

U.S. Cl. 106—288 B **24 Claims**

1. A process for preparing a pigmentary bright primrose yellow monoclinic bismuth vanadate comprising:

A. mixing a solution of $Bi(NO_3)_3.5H_2O$ in nitric acid with a solution of alkali vanadate in an aqueous base selected from sodium hydroxide and potassium hydroxide, to precipitate a bismuth vanadate gel suspended in a solution containing dissolved alkali nitrate, wherein the molar ratio of Bi^{3+} to VO_4^{3-} is from about 0.90:1.00 to 1.10:1.00, and wherein the normalities of the acid and base solutions are adjusted prior to mixing so that the pH of the mixture will be from about 1.0 to 11.0;

B. adjusting the pH of the suspension to about 2.2–6.0 with an aqueous base selected from sodium hydroxide and potassium hydroxide if the pH is less than about 2.2, or

with an acid selected from nitric acid or sulfuric acid if the pH is greater than about 6.0;

C. removing the gel from the suspension;

D. washing the gel with water until it contains about 10 percent or less alkali nitrate, based on the theoretical yield of bismuth vanadate;

E. heating the gel in water at about 60°–200° C. for at least about 0.2 hour adjusting the pH of the suspension, if necessary, to about 2.2–6.0 with an aqueous base selected from sodium hydroxide and potassium hydroxide if the pH is less than about 2.2, or with an acid selected from nitric acid, hydrochloric acid, hydrobromic acid, sulfuric acid, or phosphoric acid if the pH is greater than 6.0 to convert it to monoclinic bismuth vanadate pigment;

F. adjusting the pH of the suspension to 8.0 to 9.5 with an aqueous base selected from sodium hydroxide or potassium hydroxide and holding at this pH at a temperature of 50°–100° C for fifteen to thirty minutes; and

G. filtering, washing and drying the pigment.

4,115,142

PIGMENTARY BRIGHT PRIMROSE YELLOW MONOCLINIC BISMUTH VANADATE AND PROCESSES FOR THE PREPARATION THEREOF

Richard William Hess, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 698,692, Jun. 22, 1976, abandoned. This application May 9, 1977, Ser. No. 794,391

Int. Cl.² C09C *1/00*

U.S. Cl. 106—288 B **18 Claims**

1. A pigmentary bright primrose yellow monoclinic bismuth vanadate.

4,115,143

DUST-FREE THERMALLY STABLE LEAD CHROMATE PIGMENT COMPOSITION AND PROCESS OF PREPARATION

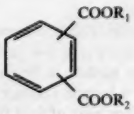
Kenneth Batzar, Piscataway, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 690,937, May 28, 1976, abandoned. This application Jun. 22, 1977, Ser. No. 808,995

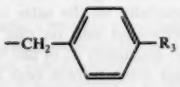
Int. Cl.² C09C *1/20*

U.S. Cl. 106—298 **8 Claims**

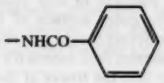
1. Lead chromate pigment composition consisting essentially of from 75 to 98% by weight of lead chromate pigment, based on the weight of the composition, and from 2 to 25% by weight, based on the weight of the composition, of at least one organic ester selected from esters of phthalic and terephthalic acid of the formula



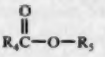
where R_1 and R_2 are each independently selected from alkyl of 3 to 20 carbon atoms, benzyl of the formula



where R_3 is selected from —H, —SO_3H, and



and esters of fatty acids of the formula



where R_4 is alkyl of 5 to 20 carbon atoms and R_5 is an alkyl of 2 to 10 carbon atoms.

4,115,144

METHOD OF PREPARING METAL OXIDE SLURRIES

Hubert Harold Chambers, Waltham, and Brian John Tear, Grimsby, both of England, assignors to Laporte Industries Limited, London, England

Filed Dec. 2, 1976, Ser. No. 746,674

Claims priority, application United Kingdom, Dec. 23, 1975, 52512/75

Int. Cl.² C09C *1/36*

U.S. Cl. 106—300 **13 Claims**

1. A process for the production of an alkaline aqueous slurry having a negative charge and a solids content of at least 60% by weight, of a coated pigmentary titanium dioxide, which comprises;

(a) providing an aqueous dispersion of pigmentary particles of titanium dioxide;

(b) forming a coating on said particles by simultaneously precipitating in the dispersion at an alkaline pH, at least two different metal oxides, at least one of said metal oxides being selected from those giving an isoelectric point at a pH below 7 and at least one of said metal oxides being selected from those giving an isoelectric point at a pH above 7, under conditions such that a filterable, washable slurry is obtained;

(c) filtering and washing the coated particles in the slurry to obtain a washed filter cake;

(d) raising the concentration of the washed filter cake to at least 60% by weight of coated particles;

(e) redispersing the particles of the raised concentration filter cake; and

(f) maintaining the filtered, washed, coated particles at a temperature of from 40° C to 100° C for a duration of at least 20 minutes.

4,115,145

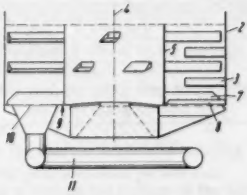
DIFFUSION TOWER FOR SUGAR BEET COSSETTES

Walter Dietzel, Braunschweig, and Martin Athenstedt, Sehnde, both of Fed. Rep. of Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,618

Int. Cl.² C13D *1/12*

U.S. Cl. 127—5 **13 Claims**



1. A diffusion tower for sugar beet cossettes comprising a housing constructed as an upright hollow cylinder having a

top and bottom, conveyor shaft means coaxially and concentrically supported for rotation in said cylinder housing, wing means secured to the outer surface of said conveyor shaft means, cossettes distributing means secured to the lower end of said conveyor shaft means, feed means for supplying a mixture of cossettes and juice into the tower at the lower end thereof, juice discharging means operatively connected to the lower tower end, pulp discharging means and extraction liquid supply means operatively connected to the upper end of said tower housing, said feed means comprising feed slot means arranged in said tower bottom between the conveyor shaft means and the housing, and feed conduit means operatively connected to the slot means.

4,115,146

PROCESS FOR THE DEPOLYMERIZATION OF STARCH BY IRRADIATION AND PRODUCTS SO OBTAINED

Louis Saint-Lébe, Aix-en-Provence; Gérard Berger, Maisons-Alfort; Jean-Pierre Michel, Aix-en-Provence; Michel Huchette, and Guy Flèche, both of Lestrem, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Roquette Freres, Lestrem, both of, France

Filed Oct. 27, 1976, Ser. No. 736,208

Claims priority, application France, Oct. 30, 1975, 75 33245

Int. Cl.[2] C13K *1/06;* **C13L** *1/08;* **C08L** *3/00;* **B01J** *1/10*

U.S. Cl. 127—38 **14 Claims**

1. Process for depolymerising starch by irradiation characterised by the fact that granular starch, whose water content is at the most about 23%, is subjected, in the presence of an acid which is neutralised at the end of the treatment, to a dose of radiation less than 3 Mrad.

4,115,147

PROCESS FOR PRODUCING NUTRITIVE SUGAR FROM CANE JUICE

Junichi Shimizu, Yokohama, and Kyosuke Hashizume, Chiba, both of Japan, assignors to Mitsui Sugar Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 779,279

Claims priority, application Japan, Apr. 1, 1976, 51-36357

Int. Cl.[2] C13D *3/16;* **C13F** *3/00*

U.S. Cl. 127—54 **3 Claims**

3. A process for producing a nutritive brown sugar from cane juice, which comprises; processing the juice through an ultrafiltration means; and evaporating the permeate to obtain a non-centrifugal, nutritive brown sugar.

4,115,148

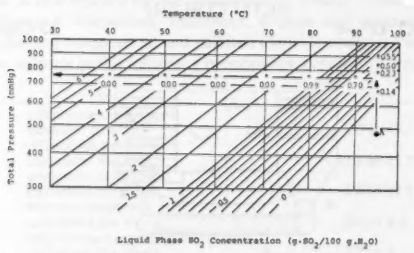
METHOD FOR PREVENTING CORROSION OF A SULFUR DIOXIDE REGENERATING APPARATUS

Masao Okubo; Masayoshi Miki, both of Niihama, and Takeshi Ueda, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 15, 1976, Ser. No. 733,282

Int. Cl.[2] B08B *7/04*

U.S. Cl. 134—21 **2 Claims**



1. In a method of cleaning an apparatus of stainless steel wherein an SO_2-containing absorption solution has been heated under subatmospheric pressure in said apparatus to release gaseous SO_2 from said solution, which comprises the steps of elevating the pressure in the apparatus to atmospheric pressure, lowering the temperature in the apparatus to room temperature, removing the absorption solution from the apparatus and washing the apparatus with water, the improvement which comprises preventing corrosion of the apparatus by effecting the elevation of the pressure to the atmospheric pressure by introducing an inert gas into the apparatus to produce an air concentration of not more than 5% by volume therein and by effecting the lowering of the temperature to room temperature while maintaining said air concentration in the apparatus.

4,115,149

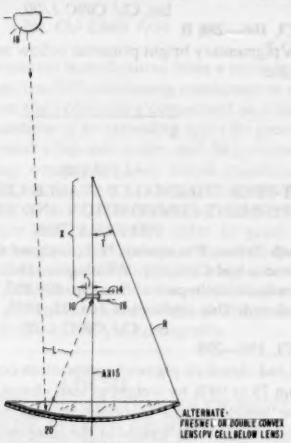
CONCENTRATOR ARRANGEMENT FOR PHOTOVOLTAIC CELL

Ronald L. Bell, Woodside, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 666,273, Mar. 12, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,937

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **24 Claims**



1. In a solar energy conversion unit:

an optical concentrator,

a photovoltaic cell comprising; a front surface for receiving electromagnetic energy, a p-n junction, a back surface opposite said front surface, a first conductive contact on said back surface, a second contact comprising a conductor covering a minor part of said front surface, and

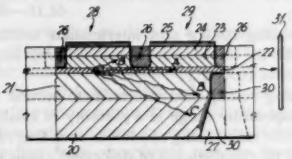
means for mutually positioning said concentrator and said cell;

said concentrator and said cell being shaped and mutually positioned such that, in operation, when said unit is aimed at the sun, essentially all the solar radiation emanating from said concentrator falls on said front surface, said radiation covers essentially all of said front surface, and in a region on said front surface near said conductor the radiation intensity is at least 25% greater than the average intensity over said front surface.

4,115,150
METHOD OF PRODUCING OPTOELECTRONIC DEVICES WITH CONTROL OF LIGHT PROPAGATION

John Cameron Dyment, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 694,333, Jun. 9, 1976, Pat. No. 4,080,617.
This application Feb. 7, 1977, Ser. No. 765,900
Int. Cl.[2] H01L 33/00
U.S. Cl. 148—1.5 2 Claims



1. A method of producing an optoelectronic device having a light propagating path along an axis thereof; comprising:

forming a first confining layer of semiconductor material on a substrate of semiconductor material, said confining layer and said substrate of the same conductivity type;

forming an active layer of semiconducting material on said first confining layer and forming a second confining layer on said active layer, said second confining layer of opposite conductivity type to said first confining layer and said active layer of the same conductivity type as one of said confining layers;

forming a masking layer over said second confining layer;

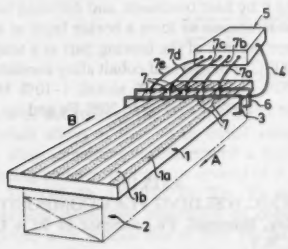
removing part of said masking layer to define at least one area extending transversely of said light propagating path;

proton bombarding said area to form a photon absorbing barrier beneath said area, extending into but not beyond said second confining layer, said photon absorbing barrier extending transversely of said light propagating path, whereby light can propagate freely in said active layer along said path and is absorbed at said photon absorbing barrier in said second confining layer.

4,115,151
METHOD AND APPARATUS FOR WORKPIECE SURFACE TREATMENT

Bengt Johansson, Göteborg, Sweden, assignor to Centro-Maskin Goteborg AB, Goteborg, Sweden

Filed May 25, 1977, Ser. No. 800,410
Claims priority, application Sweden, Jun. 4, 1976, 7606357
Int. Cl.[2] B23K 7/06
U.S. Cl. 148—9.5 5 Claims

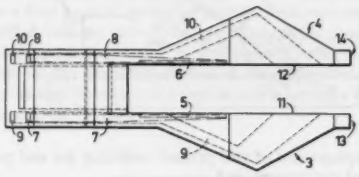


1. A method of surface treating a workpiece by spot planing during relative movement between the workpiece and a plurality of planing devices, characterized in that the planing begins by a flying start and is accomplished during at least two feed steps with at least two laterally arranged planing devices in such a way that a strip of the workpiece between each planing device is left unworked during the first feed step, which strip, after a relative movement, transverse to the feed direction between the planing devices and the workpiece, will be worked during a subsequent feeding step.

4,115,152
METHOD AND DEVICE FOR GAS PLANING A WORKPIECE SURFACE TO REMOVE SURFACE DEFECTS

Bengt Johansson, Göteborg, Sweden, assignor to Centro-Maskin Goteborg AB, Goteborg, Sweden

Filed Jul. 13, 1977, Ser. No. 815,272
Claims priority, application Sweden, Jul. 19, 1976, 7608208
Int. Cl.[2] B23K 7/00, 7/06
U.S. Cl. 148—9.5 5 Claims



1. A method of gas planing with at least one planing device, wherein the gas flowing out of the device is confined laterally in relation to the working direction, characterized in that gas streams are directed substantially perpendicularly onto the workpiece from both sides of the gas flowing out of the planing device for applying a lateral retaining effect on the melt being formed, and gas streams simultaneously are directed to the forward portion of the melt for applying a lifting and removing effect thereon.

4,115,153
METHOD AT GAS PLANING

Bengt Johansson, Göteborg, Sweden, assignor to Centro-Maskin Goteborg AB, Goteborg, Sweden

Filed Jul. 13, 1977, Ser. No. 815,373
Claims priority, application Sweden, Jul. 19, 1976, 7608209
Int. Cl.[2] B23K 7/00, 7/06
U.S. Cl. 148—9.5 2 Claims

1. An improvement in gas planing or scarfing undertaken to remove surface defects on a workpiece, wherein an oxidizing gas is supplied to the workpiece by a planing device, the oxidizing gas being directed onto the workpiece in a manner such that in addition to oxidizing the workpiece, the molten material is also removed from the surface of the workpiece, the improvement consisting of substituting air for the oxidizing gas at the termination of the scarfing process, the air thus supplied carrying away the melt material in the same manner as the oxidizing gas, before the melt has hardened, thus leaving a clean surface free from deposits.

4,115,154
METHOD AND APPARATUS FOR PRODUCING A POST-MIXED, STABILIZED SCARFING PRE-HEATING FLAME

Ronald Elmer Fuhrhop, Suffern, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,512
Int. Cl.[2] B23K 7/04, 7/08
U.S. Cl. 148—9.5 19 Claims

1. A process for thermochemically scarfing a metal workpiece comprising:

(1) preheating a spot on the surface of the workpiece where the scarfing reaction is to begin by directing a post-mixed preheating flame at said spot, said preheating flame being formed by:

(a) discharging at least one stream of preheat oxidizing gas and at least one stream of preheat fuel gas from separate ports in such a manner that said streams impinge external to their discharge ports, above the work surface and in such manner that the axes of said streams form an acute included angle between them, and

(b) stabilizing said preheating flame by discharging a low-intensity stream of oxidizing gas, the direction of said stabilizing stream being in the same general direction as the direction of said flame and proximate to the

impingement of said preheat oxidizing gas and preheat fuel gas streams, and

(c) continuing steps (a) and (b) until said spot reaches its oxidizing gas ignition temperature, and thereafter

(2) directing a stream of scarfing oxidizing gas at an acute angle to the work surface at said preheated spot, while simultaneously

(3) causing relative movement between said scarfing oxidizing gas stream and said work surface, thereby producing a scarfing cut.

4,115,155

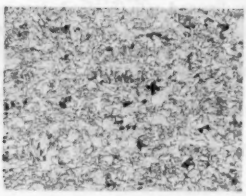
LOW CARBON HIGH YIELD AND TENSILE STRENGTH STEEL AND METHOD OF MANUFACTURE

Gerald J. Roe, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 651,662, Jan. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 466,760, May 3, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,838

Int. Cl.[2] C21D *7/14*

U.S. Cl. 148—12 F **6 Claims**



1. A process for producing low carbon high yield strength steel alloy plate characterized in the as-rolled condition by an unbanded microstructure of ferrite, pearlite, and lower transformation products and a minimum yield strength of 75,000 psi., comprising the steps of:

(a) providing a slab consisting essentially by weight of:

	Percent, about
Carbon	.04–.07
Manganese	1.00–1.60
Sulfur	.015 max.
Columbium	.10 max.
Boron	.0005–.004
Silicon	.40 max.

-continued

	Percent, about
Aluminum	.02 min.

and the balance iron with residual impurities;

(b) austenitizing said slab at a temperature between 2200° F. and 2300° F.;

(c) rolling said slab to an intermediate section before the temperature of said intermediate section reaches about 1650° F.;

(d) commencing rolling said intermediate section to final gage while the temperature of said intermediate section is below about 1650° F.;

(e) continuing rolling said intermediate section in the Ar_3–Ar_1 temperature range in a plurality of small reduction passes while maintaining conditions such that substantially complete recrystallization of deformed grains takes place after each said reduction pass;

(f) continuing rolling said intermediate section below the Ar_1 temperature with a maximum reduction of about 15% and a finishing temperature between 1150° F. and 1100° F.;

(g) providing a minimum total reduction of said intermediate section below 1650° F. of about 50%; and

(h) cooling said steel plate to room temperature after completion of the rolling.

4,115,156

METHOD OF MANUFACTURING A BEARING PART

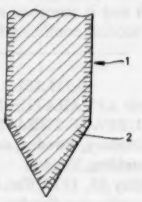
Fritz Straumann, Waldenburg, Switzerland, assignor to Institut Dr. Ing. Reinhard Straumann AG, Switzerland

Filed Feb. 10, 1976, Ser. No. 656,851

Claims priority, application Switzerland, Feb. 10, 1975, 1587/75

Int. Cl.[2] C22F *1/02*

U.S. Cl. 148—12.7 N **3 Claims**



1. A method of manufacturing a bearing part comprising forming a ductile age-hardening alloy of cobalt into a bearing part and aging it by heat treatment, and diffusing boron during the same heat treatment to form a boride layer at and into the bearing surface portion of the bearing part at a temperature of from 550°–900° C. wherein said cobalt alloy consists essentially of from 18–50% cobalt, 13–65% nickel, 1–10% Mo, 10–20% chromium, up to 10% W and up to 20% Fe and up to 4% of Ti and Be.

4,115,157

ORGANIC WELDING FLAX COMPOSITION

Marvin Packer, Broomall, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,680

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—23 **7 Claims**

1. A non-flowing, water soluble composition comprising a mixture of a solid polyalkylene glycol which contains 0 up to about 50% by weight of a polyhydroxyalkane, from 1 to 20 parts by weight of a surface active agent per 100 parts of the polyalkylene glycol component and from about 70 to about

100 parts by weight of a starch filler per 100 parts of the polyalkylene glycol component.

4,115,158

PROCESS FOR PRODUCING SOFT MAGNETIC MATERIAL

Orville W. Reen, New Kensington, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1977, Ser. No. 839,086
Int. Cl.[2] C04B *35/00*; H01F *1/04, 1/14*
U.S. Cl. 148—31.55 **5 Claims**

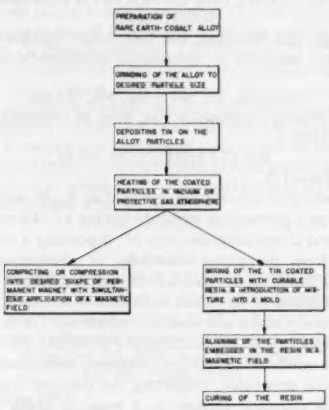
1. In a process for producing a phosphorus-bearing soft magnetic material, which process includes the step of: blending iron powder and ferro-phosphorus powder into a mixture containing from 0.4 to 1.25% phosphorus; pressing said blended mixture into a compact; and sintering said compact in a non-oxidizing atmosphere; the improvement comprising the step of blending ferro-phosphorus powder having no more than 0.2% calcium with iron powder having no more than 0.02% calcium, said ferro-phosphorus powder having from 12 to 30% phosphorus.

4,115,159

METHOD OF INCREASING THE COERCIVE FORCE OF PULVERIZED RARE EARTH-COBALT ALLOYS

Ekkehard Greinacher; Klaus Reinhardt, both of Essen, Germany, and Karl Strnat, Fairborn, Ohio, assignors to TH. Goldschmidt AG, Essen, Germany

Division of Ser. No. 116,533, Feb. 18, 1971, Pat. No. 4,063,971, which is a continuation-in-part of Ser. No. 62,005, Aug. 7, 1970, abandoned. This application Aug. 2, 1977, Ser. No. 821,153
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1969, 1940464
Int. Cl.[2] H01F *1/06*
U.S. Cl. 148—105 **3 Claims**


PREPARATION OF RARE EARTH-COBALT ALLOY
GRINDING OF THE ALLOY TO DESIRED PARTICLE SIZE
DEPOSITING TIN ON THE ALLOY PARTICLES
HEATING OF THE COATED PARTICLES IN VACUUM OR PROTECTIVE GAS ATMOSPHERE
COMPACTING OR COMPRESSION INTO DESIRED SHAPE OF PERMANENT MAGNET WITH SIMULTANEOUS APPLICATION OF A MAGNETIC FIELD
MIXING OF THE TIN COATED PARTICLES WITH CURABLE RESIN & INTRODUCTION OF MIXTURE INTO A MOLD
ALIGNING OF THE PARTICLES EMBEDDED IN THE RESIN IN A MAGNETIC FIELD
CURING OF THE RESIN

1. A method of maintaining the coercive force of particulate rare earth-cobalt alloys at least at its initial value, said rare earth-cobalt alloy consisting essentially of a first rare earth component being composed of one or several of Y, Sc, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu and a second component consisting essentially of cobalt alone or cobalt in mixture with at least one of Mn, Fe, Ni, or Cu, the ratio of the rare earth component to the second component being about 10–25 atomic percent to 75–90 atomic percent, which comprises depositing tin on the surface of the alloy particles from a tin salt solution containing said particulate rare earth-cobalt alloy to envelop substantially each particle with a substantially continuous layer of tin and then heating the enveloped alloy particles to a temperature sufficiently high so as to cause diffusion of tin into the particle structure.

4,115,160

ELECTROMAGNETIC SILICON STEEL FROM THIN CASTINGS

James G. Benford, and Harry L. Bishop, Jr., both of Pittsburgh, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Jun. 16, 1977, Ser. No. 807,092
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—111 **8 Claims**

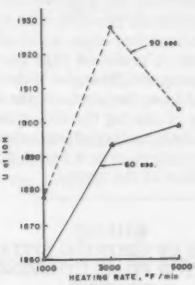
1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel containing, by weight, up to 0.07% carbon, from 0.015 to 0.24% manganese, from 0.01 to 0.09% of material from the group consisting of sulfur and selenium, up to 0.0080% boron, up to 0.05% aluminum, up to 0.0200% nitrogen, up to 1.0% copper and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel to a final gage no greater than 0.020 inch, said steel being cold rolled with no more than two cold rolling passes being separated by an intervening anneal; decarburizing said steel; and final texture annealing said steel; the improvement comprising the step of casting said steel as a strip having a thickness of from 0.15 to 1.0 inch.

4,115,161

PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

Amitava Datta, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Oct. 12, 1977, Ser. No. 841,402
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—111 **14 Claims**



1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1870 (G/Oe) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel to a thickness no greater than 0.020 inch; recrystallizing the cold rolled steel at a temperature between 1300° and 1550° F. in a hydrogen-bearing atmosphere having a dew point of from +50° to +150° F.; decarburizing said steel to a carbon level below 0.005%; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement comprising the steps of heating said steel to said temperature range of between 1300° and 1550° F. at a heating rate of at least 1500° F. per minute; and holding said steel within said temperature range for a period of at least 30 seconds.

4,115,162
PROCESS FOR THE PRODUCTION OF EPITAXIAL LAYERS ON MONOCRYSTALLINE SUBSTRATES BY LIQUID-PHASE-SLIDE EPITAXY

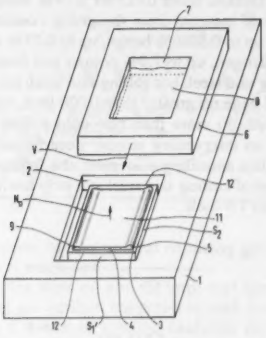
Dieter Pawlik, Munich, and Karl-Heinz Zschauer, Grafing, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1977, Ser. No. 833,052

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641347

Int. Cl.[2] H01L *21/208*

U.S. Cl. 148—171 **12 Claims**



1. In a method for the production of epitaxial layers on monocrystalline substrates by a liquid-phase-slide epitaxy process, said method including providing a monocrystalline substrate having a surface, shifting a slide in one direction to move a melt onto said surface, depositing a monocrystalline, epitaxial layer of material from the melt onto the surface of the substrate, and subsequently moving the slide in said one direction to remove the remaining portion of the melt from the substrate and layer deposited thereon, the improvement comprising the step of providing a substrate provides a crystal having a surface with at least two boundary edges which are parallel to one another and in which no preferred edge growth occurs in a direction N_1, N_1' running at right angles to the boundary edges, and pointing outward from the interior of the substrate crystal, and wherein the step of moving the slide moves the slide in a direction relative to the boundary edges so that the melt moves across said boundary edges as it is being applied to and removed from the surface of the crystal.

4,115,163
METHOD OF GROWING EPITAXIAL SEMICONDUCTOR FILMS UTILIZING RADIANT HEATING

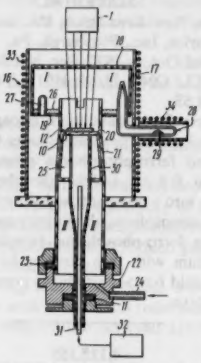
Yulia Ivanovna Gorina, Polyarnaya ulitsa, 8, kv. 100; Galina Alexandrovna Kaljuzhnaya, Universitetsky prospekt 6, kor. 2, kv. 102; Andrei Vasilievich Kuznetsov, ulitsa Vavilova, 45, kv. 24; Sergei Nikolaevich Maximovsky, Leningradskoe shosse, 118, kv. 63; Mikhail Borisovich Nikiforov, ulitsa Vavilova, 72, kv. 12; Bentsion Moiseevich Vul, ulitsa Vavilova 44, kor. 4, kv. 139; Galina Evgenievna Ivannikova, Okskaya ulitsa 12, kor. 1, kv. 75, all of Moscow; Vintsentas Ionovich Denis, ulitsa Suvalku, 8, kv. 3, Vilnjus; Mikolas Mikolo Yarmalis, ulitsa Mintes, 5, kv. 34, Vilnjus, and Vitautas Ionovich Repshis, ulitsa Dzerzhinskogo, 48/2, kv. 4, Vilnjus, all of U.S.S.R.

Filed Jan. 8, 1976, Ser. No. 647,327

Int. Cl.[2] H01L *21/205*

U.S. Cl. 148—175 **5 Claims**

1. A vapor phase method for growing epitaxial semiconductor films, in an enclosed chamber, of silicon and the type selected from the group consisting of monocrystalline, A_2B_6 and A_4B_6 on a substrate with a support which does not absorb radiant heat comprising: heating a working surface of said substrate in an inert atmosphere to a critical epitaxy temperature by means of radiant light having a luminous flux intensity from about 10^1 to 10^4 watts per square centimeter of substrate surface, said critical temperature sufficient to enable epitaxial growth on the working surface of said substrate; introducing a gaseous source material capable of forming a film on the work-



ing surface of said substrate exposed to the radiant light, while simultaneously force cooling the opposite side of the working surface of the substrate to a temperature gradient sufficient to prevent mutual diffusion between the film being deposited on the working surface of the substrate, and the substrate components.

4,115,164
METHOD OF EPITAXIAL DEPOSITION OF AN $A_{III}B_V$-SEMICONDUCTOR LAYER ON A GERMANIUM SUBSTRATE

Hans Jager, Bad Homburg, and Emil Seipp, Eschborn, both of Germany, assignors to Metallurgie Hoboken-Overpelt, Belgium

Filed Jan. 10, 1977, Ser. No. 757,935

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601652

Int. Cl.[2] H01L *21/20, 29/26*

U.S. Cl. 148—175 **18 Claims**

1. A method of epitaxial depostion of an $A_{III}B_V$-semiconductor layer on a germanium substrate having a (100) orientation, said method comprising the steps of: depositing a resist layer, selected from the group consisting of phosphosilica glass (PSG) and Si_3N_4, on the backside of the Ge substrate to passivate the backside to an extent such that it becomes thermally and chemically stable and does not release any Ge to the ambient atmosphere; chemo-mechanically polishing the front side of the Ge substrate to microsmoothness; immediately before the epitaxial deposition, subjecting the polished front side to very weak chemical etching to a removal depth of 500 A without eliminating the polish or microsmoothness of the front side; thereupon heating the substrate, in a high-purity hydrogen atmosphere, to a temperature between about 680° C and 720° C, and depositing a GaAs layer on said front side; thereafter increasing the temperature and depositing, on the GaAs layer, a ternary $A_{III}B_V$ compound including a third, additive component whose proportion increases in the direction away from the GaAs layer and which is selected from the group consisting of A_{III} elements and B_V elements; continuing the increase in concentration of said third, additive component to a predetermined final value determined by one of the band gap and corresponding wavelength of the emitted light; and, as a final step, depositing a relatively thick layer of said ternary $A_{III}B_V$ compound whose composition is maintained constant at said predetermined final value of the second layer.

4,115,165
HYDROPHOBIC ALUMINUM SENSITIZING AGENTS FOR EXPLOSIVES

Oldrich Machacek, Allentown, Pa., assignor to Atlas Powder Company, Tamaqua, Pa.

Filed Jun. 23, 1977, Ser. No. 809,203
Int. Cl.[2] C06B 45/30
U.S. Cl. 149—5 14 Claims

1. A sensitizing agent for explosive compositions comprising coarse grade particulate aluminum substantially coated with finely divided hydrophobic fumed silica.

4,115,166
COATED AMMONIUM PERCHLORATE

Edwin L. Lista, Roseville; Richard B. Hartupee, West Covina; Ralph K. Manfred, Carmichael, and Paul L. O'Neil, Sacramento, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 12, 1970, Ser. No. 3,548
Int. Cl.[2] C06B 45/34
U.S. Cl. 149—7 8 Claims

1. The novel solid rocket propellant containing as the oxidizer ammonium perchlorate particles containing thereon a coating agent comprising an alkylene imine adduct of divinylbenzene selected from the group consisting of the ethylene, propylene or butylene adducts thereof.

4,115,167
CASTABLE BINDER FOR CAST PLASTIC-BONDED EXPLOSIVES

Dino A. Sbrocca, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

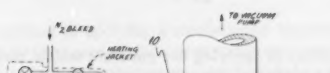
Filed Nov. 11, 1974, Ser. No. 522,674
Int. Cl.[2] C06B 45/10
U.S. Cl. 149—19.5 3 Claims

1. In a cast plastic bonded explosive wherein high explosive filler material is bound in a matrix of binder material, the improvement residing in utilizing a mixture of (1) 42 parts by weight of a composition made up of styrene and an unsaturated polyester resin derived from propylene glycol, maleic anhydride and phthalic anhydride wherein the ratio of maleic anhydride to phthalic anhydride is relatively low and (2) 30 parts by weight of a composition made up of styrene and an unsaturated polyester resin based upon diethylene glycol, maleic anhydride and adipic acid to which (3) 28 additional parts of styrene have been added to form a binder material.

4,115,168
CARBON MONOSULFIDE GENERATING PROCESS

Victor R. Buonadonna; Ralph J. Richardson; Richard L. Rasmussen, and William Q. Jeffers, all of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 20, 1975, Ser. No. 623,662
Int. Cl.[2] C06B 23/00
U.S. Cl. 149—109.6 7 Claims



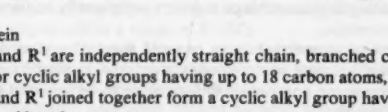
1. A method of producing CS as an entity comprising the steps of heating CS_2 with a fuel-oxidizer flame in a system containing a fuel, an oxidizer and CS_2 to a temperature of at least 2400 K to produce a mixture of CS and CS_2, recovering the mixture from the system in a form in which the ratio of CS/CS_2 is at least 2 by passing the gases produced by the system through a nozzle in a supersonic expansion thereby to preserve the CS as an entity in the mixture for a predetermined period of time by means of said supersonic expansion, and employing said mixture to utilize said CS entity within said predetermined period of time.

4,115,169
POLYFUNCTIONAL ESTER KETIMINES, ADHESIVES DERIVED THEREFROM AND METHOD FOR ADHERING MATERIALS

William D. Emmons; Samuel S. Kim, both of Huntingdon Valley, and Donald A. Winey, Warminster, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 6, 1977, Ser. No. 757,264
Int. Cl.[2] E04B 2/00; C09J 5/00
U.S. Cl. 156—71 21 Claims

1. A compound of the formula:



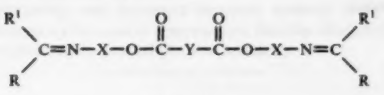
wherein

R and R^1 are independently straight chain, branched chain, or cyclic alkyl groups having up to 18 carbon atoms, or R and R^1 joined together form a cyclic alkyl group having 4 to 11 carbon atoms;

X is a divalent alkylene radical having 2 to 10 carbon atoms or an oxyalkylene chain having 2 to 5 repeating units of the structure $—OCHR^2CHR^2—$where R^2 is hydrogen or methyl; and

Y is the non-carboxyl moiety of a saturated, or aromatic dicarboxylic acid, or acid terminated polyester chain thereof with ethylene glycol, propylene glycol or isobutylene glycol.

6. A moisture-curable adhesive and coating composition comprised of a mixture of (A) one part by weight of a bisketimino ester of the formula:



wherein

R and R^1 are independently straight chain, branched chain, or cyclic alkyl groups having up to 18 carbon atoms, or R and R^1 joined together form a cyclic alkyl group having 4 to 11 carbon atoms;

X is a divalent alkylene radical having 2 to 10 carbon atoms or an oxyalkylene chain having 2 to 5 repeating units of the structure $—OCHR^2CHR^2—$ where R^2 is hydrogen or methyl; and

Y is the non-carboxyl moiety of a saturated, or aromatic dicarboxylic acid, or acid terminated polyester chain thereof with ethylene glycol, 1,4-butanediol, propylene glycol or isobutylene glycol; and

(B) from about one to about ten parts by weight of organic acid polyanhydride.

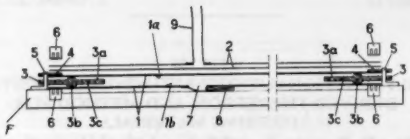
12. A method of gluing down carpet which comprises applying the composition of claim 6 as the adhesive therefor and allowing the adhesive to cure in the presence of moisture.

4,115,170

CUSHION OR SEAT STRUCTURE OF PLASTIC FOAM WITH INTEGRATED COVER AND INCORPORATED REINFORCING GRID OR SKELETON, AND METHOD OF MAKING SAME

Joseph F. Sanson, Beaugency, France, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1977, Ser. No. 786,126
Claims priority, application France, Feb. 22, 1976, 76 11950
Int. Cl.[2] A47C *7/18*
U.S. Cl. 156—79 **12 Claims**



1. A method of making integrated cushion structures having opposed pliable congruent cover sheet members and at least one partitioning sheet means coextensive with said cover sheets, all of said sheets being joined peripherally to define an enclosing envelope having a plurality of coextensive interior compartments, and plastic foam filling at least some of said compartments, said method comprising:

forming an assemblage of said pliable congruent cover sheet members and partitioning sheet means;

bonding said assemblage together peripherally to form said envelope;

forming an aperture in an exposed sheet of said envelope, said aperture being suitably sized and located to enable remaining portions of the envelope to be inverted therethrough;

drawing the remaining portions of said envelope through said aperture and thereby turn said envelope inside-out to dispose cover sheet members externally and partitioning sheet means internally of said inverted envelope, said partitioning sheet means dividing the interior of said envelope into at least two coextensive interior compartments; and

placing said envelope into a forming mold and introducing a foamable plastic mix into at least one of said interior compartments, and allowing said mix to expand and become integrally bonded on polymerization to the surface of the respective sheets defining said compartments while in said mold.

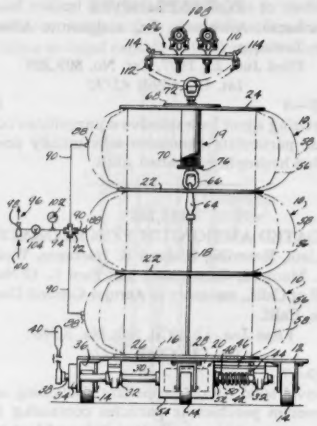
4,115,171

RETREADING STACKED TIRES

Michael J. Dundon, Muscatine, Iowa, assignor to Bandag Incorporated, Muscatine, Iowa

Filed Sep. 20, 1976, Ser. No. 724,766
Int. Cl.[2] B29H *17/00*
U.S. Cl. 156—96 **8 Claims**

1. A method of preparing tires for retreading comprising: applying to the periphery of each tire a pre-cured tread strip with a vulcanizable bonding medium disposed between the tire periphery and the tread strip; applying an annular U-shaped envelope to the periphery of each tire so that the edge portions of the envelope overlie the rim or shoulder portion of the tire; stacking the tires vertically on a support with a plate disposed between each two adjacent tires, the plates engaging the edge portion of the envelopes; placing a top plate on the upper surface of the uppermost tire; connecting a tensioning device between the top plate and the support to compress the stack thereby sealing each tire to the edge portions of its respective envelope; while the stack is compressed, applying suction to the space between each tire and the inner surface of its respective envelope, to remove air from said space; and thereafter placing the assembly of stacked tires and plates in an autoclave.

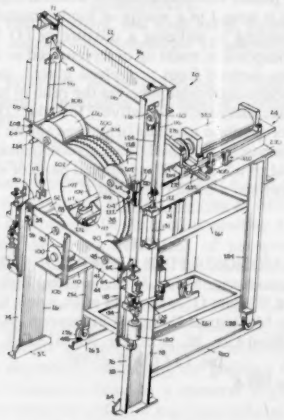


4,115,172

APPARATUS AND METHOD FOR APPLYING PUNCTURE SEALANT MATERIAL TO A TIRE

Leon Ian Baboff, Bethany; Daniel Shichman, Trumbull, and Lawrence Paul Reed, Newtown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,477
Int. Cl.[2] B60C *21/08*
U.S. Cl. 156—115 **22 Claims**



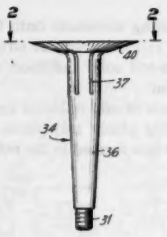
21. A method of applying tire puncture sealant material to the liner of a cured tire comprising, orienting the tire with the equatorial plane in a substantially vertical position, spreading the beads of the tire a predetermined amount to furnish the tire with a predetermined profile in the area of the spread beads, rotating the tire at a predetermined speed, applying sealant material to the liner of the tire under the tread region while the tire is rotating, using an applicator having a cross-sectional profile corresponding to the predetermined cross-sectional profile of the tire in the area of the spread beads by engaging the applicator head with the tire liner and forcing sealant material out of the applicator at a predetermined fixed rate of discharge to provide a uniform layer of sealant.

4,115,173

VALVE BASE ROUGHENING PROCESS

Christian H. Qualey, Altavista, Va., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,307
Int. Cl.[2] B29H *15/00*; B29C *27/00*
U.S. Cl. 156—120 5 Claims



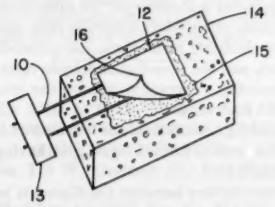
1. In a method for bonding a base on flange of a molded rubber valve device to a rubber pneumatic tube, said method including molding a sleeve, which includes said base, around the valve device, said base having its outer surface formed by a contacting surface of a mold plunger: and roughening said outer surface of said base which is to contact extensively the rubber tube surface and vulcanizing said base to said tube; the improvement comprising: performing said roughening step by shaping said outer surface into a cross-hatched or knurled pattern with said mold plunger.

4,115,174

METHOD OF APPLYING MINIATURIZED HIGH-TEMPERATURE FREE-GRID STRAIN GAUGES

Heinrich Franz Bauer; Anton Eichinger, both of Eichenau, and Ernst Feitzelmayer, Munich, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,613
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630475
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—155 7 Claims



1. A method of applying a miniaturized high-temperature free-grid strain gauge of foil construction, or a similar high-temperature probe, supported on a backing foil to a test location, comprising the steps of:

(a) connecting long web means to the strain gauge while the gauge still has its backing foil on;

(b) connecting an auxiliary carrier to the web means at a distance from said gauge;

(c) adhering said gauge to a porous backing with the open grid side thereof facing downwardly through a readily soluble adhesive;

(d) peeling off the backing foil;

(e) chemically dissolving the adhesive; and

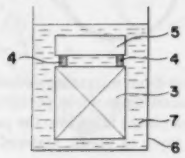
(f) applying the prepared gauge to the test location.

4,115,175

METHOD FOR MANUFACTURING SYNTHETIC RESIN PACKED PRODUCT ASSEMBLY

Kazuo Yamashita, Kawanishi; Yoshikazu Yokose, Ikeda; Masatake Akao; Koichi Hirakawa, both of Kawanishi; Katsuhiko Iho, Hirakata, and Takashi Shibano, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 13, 1977, Ser. No. 832,915
Int. Cl.[2] B29C *13/00*; B29G *7/00*
U.S. Cl. 156—172 14 Claims



1. A method for manufacturing a synthetic resin packed product assembly comprising

(a) providing around an element to be packed with hardened resin a high strength fibrous material which is provided in a continuous form, said high strength fibrous material being wound around said element in spiral form in a number of turns to interlock the wound fibrous material with an interlocking degree between the crossing fibers being arranged within a range of 5°–90°;

(b) impregnating said element, provided therearound with said fibrous material, with thermosetting resin in the liquid state to form a resin packed element;

(c) immersing said resin packed element into a hot-melt material in the liquid state which is substantially incompatible with said thermosetting resin, said hot-melt material having a melting point at a temperature higher than the initial hardening temperature of said thermosetting resin, the solubility parameter difference between said hot-melt material and said thermosetting resin being above 0.75;

(d) hardening said hot-melt material by decrease of temperature to cover said resin packed element in an air tight condition for preventing said impregnated thermosetting resin in liquid form from leaking out from said hardened hot-melt material;

(e) hardening said thermosetting resin at a temperature below said melting point; and

(f) removing said hardened hot-melt material from said element by increase of temperature, thereby obtaining said synthetic resin packed product assembly.

4,115,176

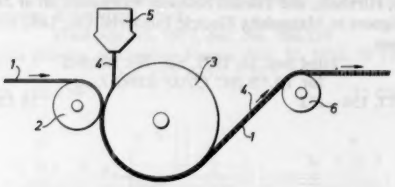
LAMINATED PAPER PRODUCT AND A METHOD FOR MANUFACTURING SAID PRODUCT

Stig Ekstrand, Lund, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Oct. 17, 1974, Ser. No. 515,521
Claims priority, application Sweden, Oct. 24, 1973, 7314397
Int. Cl.[2] B32B *27/10, 31/08, 31/20, 31/30*
U.S. Cl. 156—244.25 10 Claims

1. A method of producing a laminate of a web of porous paper and a layer of thermoplastic material in which the web of porous paper and layer of plastic material are joined at spaced areas to form a soft folding laminate comprising extruding a thermoplastic material in web form onto a smooth, rotating, cool roller, passing a web of porous paper onto the extruded layer of thermoplastic material on the cool roller at a point spaced from the point of contact of said layer of plastic material with the cool roller in the direction of rotation of the roller, passing the web of porous paper and layer of plastic material between the cool roller and a rotating profiled roller for press-

ing the web of porous paper and a layer of plastic material together at spaced areas determined by the profiled roller, the layer of extruded plastic material being cooled by the cool roller sufficiently to prevent substantial quantities of the plastic



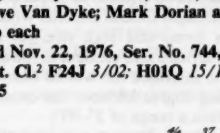
material of the layer from migrating entirely through the web of paper at the spaced areas while permitting partial penetration of the extruded plastic layer into the paper web to join the web of paper and layer of plastic material together at spaced areas.

4,115,177

MANUFACTURE OF SOLAR REFLECTORS

David H. Nelson, Twentynine Palms, Calif., assignor to Homer Van Dyke; Dave Van Dyke; Mark Dorian and George Lerg, part interest to each

Filed Nov. 22, 1976, Ser. No. 744,149
Int. Cl.[2] F24J *3/02*; H01Q *15/14*
U.S. Cl. 156—245 **11 Claims**



1. A method of making a reflector specular to infra-red solar radiation for a solar energy collector system using a female mold having therein a longitudinally extending parabolic recess with a structurally reinforced mirror finished surface, and constructing a male mold from said female mold, the steps comprising

(a) spraying a thin, tough, epoxy polyamid gelcoat onto said mirror finished surface;

(b) applying fiberglass resin mixed with chopped roving onto said coated mirror finished surface in thin layers to prevent exotherm warpage;

(c) structurally supporting said applied layers to stabilize a convex parabolic configuration on the convex surface thereof;

(d) applying a fiberglass retainer layer over said structurally supported layers of fiberglass resin mixed with chopped roving;

(e) at least partially curing said structure and removing it from said female mold;

(f) attaching transversely extending adjustable spacing means between opposing portions of said convex parabolic configuration at locations remote from the directrix thereof;

(g) adjusting said spacing means to correct for minor distortions in said parabolic configuration;

(h) bending a smooth, mirror finished planar film free of surface irregularities across said parabolic configuration and securing it thereto to form a longitudinally extending smooth rigid convex surface of precise parabolic cross section throughout, thereby completing said male mold, and thereafter:

(i) spraying said rigid convex surface with a resin release agent;

(j) spraying thereover in an uncured state and in a plurality of different operations a plurality of layers of thermosetting resin to form a reflector support structure;

(k) removing the longitudinally extending parabolic trough reflector support structure so formed from said convex surface;

(l) vacuum depositing aluminum onto the exposed concave surface of said reflector support structure to a thickness opaque to infra-red solar radiation and no greater than 0.001 inches; and

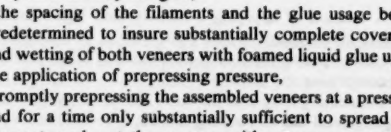
(m) closing the ends of said reflector support structure with structure utilizing planar end pieces oriented normal to the concave surface formed in the reflector support structure.

4,115,178

METHOD OF MAKING GLUED, LAMINATED ASSEMBLIES IN PREPRESSED AND FINAL PRESSED STAGES

Charles N. Cone, Portland, and Julius M. Steinberg, Hillsboro, both of Oreg., assignors to Pacific Adhesives, Inc., Hillsboro, Oreg.

Continuation of Ser. No. 624,383, Oct. 21, 1975, abandoned, which is a continuation of Ser. No. 345,107, Mar. 26, 1973, abandoned. This application May 19, 1977, Ser. No. 798,581
Int. Cl.[2] B32B *7/14, 31/00*; C09J *5/00*
U.S. Cl. 156—291 **10 Claims**



1. The method of making plywood which comprises:

(a) extruding on a surface of a first wood veneer a plywood glue comprising a member of the class consisting of the thermosetting phenol-formaldehyde resin glues, the resorcinol-formaldehyde resin glues, the cresol-formaldehyde resin glues, and the urea-formaldehyde resin glues,

(b) superimposing a second veneer on the glue-spread surface of the first veneer,

(c) the glue being extruded on the first veneer in the form of spaced filaments of foamed liquid glue having a density of from 0.1 to 0.5,

(d) the veneer surface between the filaments being substantially unwetted by the glue,

(e) the spacing of the filaments and the glue usage being predetermined to insure substantially complete coverage and wetting of both veneers with foamed liquid glue upon the application of prepressing pressure,

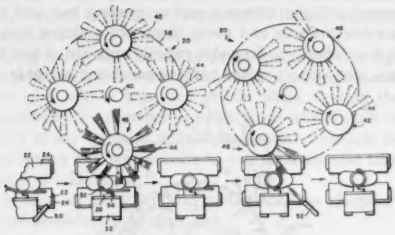
(f) promptly prepressing the assembled veneers at a pressure and for a time only substantially sufficient to spread the filaments and wet the veneers with a veneer-separating layer of unset glue still in foamed condition, thereby tacking the veneers together for preliminary handling, and

(g) thereafter further pressing the assembled and prepressed veneers at a temperature and for a time sufficient to break the foam structure of the foamed thermosetting glue, to press the veneers together, and to set the glue to its final bonding condition.

4,115,179
WRAP NECK LABEL MECHANISM

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Continuation of Ser. No. 748,060, Dec. 6, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,223
Int. Cl.[2] B65C 9/28
U.S. Cl. 156—444 9 Claims



1. Apparatus for applying labels to bottle necks comprising a conveyor defining a support for moving bottles continuously rectilinearly along a horizontal path, means located at one side of the conveyor for pressing a label into tangential engagement with the neck of a bottle traveling along said path, and wiping means beyond the place where the label is pressed into tangential engagement with the neck for successively wrapping first one end portion and then the other end portion of the label about the neck, said latter means comprising at the other side of the conveyor a stationary support spaced from the conveyor, longitudinally spaced rotors fixedly mounted on the stationary support for turning about longitudinally spaced axes perpendicular to the path of movement of the conveyor and spaced therefrom, rotary wipers mounted at equal peripheral distances about the rotors for rotation about axes spaced from and parallel to the axes of the rotors, means for rotating the rotors in a direction such that as the wipers travel around the axes of the rotors, they approach and leave the path of movement of the conveyor means along circular paths in the direction of travel of the conveyor, means on the rotary wipers which extend from the wipers into the path of movement of the conveyor, and means for rotating the rotary wipers on the respective rotors in opposite directions.

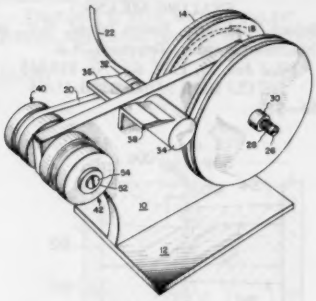
5. Apparatus according to claim 1 wherein said means at the one side of the path of travel further comprises jets spaced longitudinally of the path of travel operable successively to deflect the trailing and leading ends of the label transversely across the path of movement about the rear and forward sides of the bottle into the path of the wiping mans.

4,115,180
DISPENSER AND APPLICATOR APPARATUS FOR EDGE WRAPPING OF STAINED GLASS CHIPS AND THE LIKE WITH FOIL

Peter F. Scalia, 123 W. Chestnut St., East Rochester, N.Y. 14445

Filed Aug. 15, 1977, Ser. No. 824,363
Int. Cl.[2] B32B 31/20
U.S. Cl. 156—446 9 Claims

1. Apparatus for dispensing and wrapping foil about the edges of glass chips and the like, said apparatus comprising a frame, means mounted on said frame for supporting a roll of self-adhering foil with the roll being rotatable as the foil is withdrawn therefrom, and a wrapping roller for receiving said foil from said roll with the self adhering face of said foil facing upwardly, said roller having a peripheral groove, said groove having steps on opposite sides thereof with the groove having a first portion thereof above the step wider than a second portion thereof below the step, one of said portions having a width narrower than the width of the foil, means mounted on said frame for supporting said roller with said roller being free to rotate as one of said chips is received within said groove within at least one of said portions and presses to said foil against the sides of said one of said portions within which it is

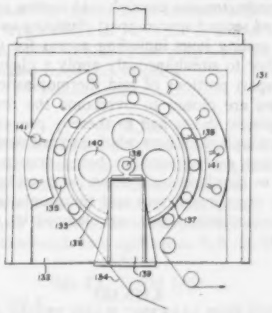


received and one of the bottom of said groove and said steps while turning said chip to simultaneously withdraw said tape from said roll and wrap said foil about the edges of said chip.

4,115,181
APPARATUS FOR PREPARING MULTI-LAMINATED SHEET

Hideo Fujii, Yokohama; Tokio Fujiki, Yamato; Masaru Uemura, Tokyo, and Masakazu Sakura, Yokohama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Jan. 28, 1977, Ser. No. 763,628
Claims priority, application Japan, Feb. 6, 1976, 51-011306; Oct. 22, 1976, 51-126278; Oct. 22, 1976, 51-126284
Int. Cl.[2] B29D 7/02; B32B 31/26
U.S. Cl. 156—497 4 Claims



1. An apparatus for preparing a multi-laminated sheet which comprises:

a first sheet feeding unit, a drying unit operably associated with said first feeding unit, a second sheet feeding unit, a superposing unit operably associated with said second feeding unit and said drying unit, a molten film extruding unit, a press-bonding unit operably associated with said film extruding unit and take-up winding unit operably associated with said press-bonding unit, said units being selectively rearrangeable;

wherein said drying unit comprises a rotary drum, a plurality of hot air nozzles for facing an adhesive coated surface of the first sheet displaced circumferentially adjacent to said rotary drum and means for cooling said rotary drum and wherein;

said drying unit further comprises a plurality of rotary guide

rollers and a coolant recycling mechanism for each of said rotary guide rollers.

4,115,182

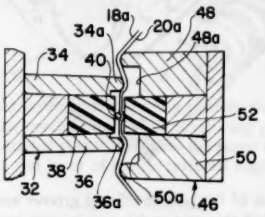
SEALING MEANS

Martin Michael Wildmoser, Staten Island, N.Y., assignor to Arenco Machine Company, Teterboro, N.J.

Filed Jun. 29, 1977, Ser. No. 810,965

Int. Cl.[2] B32B *31/00;* **B30B** *15/34*

U.S. Cl. 156—515 **8 Claims**



1. Improved sealing apparatus for cutting and heat sealing thermoplastic sheets which are drawn under tension through sealing jaws, comprising:

first and second sealing jaws movable between an open and closed position and each including a sealing section integrally formed with and recessed relative to first and second spaced-apart clamping sections,

the sealing section of at least one of said sealing jaws being deformable upon closing of said jaws,

heat-applying and cutting means adjacent at least one of said sealing sections for applying heat to cut and heat seal said thermoplastic sheets, and

one of said first and second spaced-apart clamping sections including means for preventing said thermoplastic sheets from engaging said heat-applying means while said sealing jaws are open and said thermoplastic sheets are being drawn under tension through said sealing jaws,

said first and second spaced-apart clamping sections on each of said sealing jaws including means for coacting with each other to simultaneously apply a clamping force to spaced-apart portions of said thermoplastic sheets when said jaws are closed to overcome the tension on said thermoplastic sheets and to thereby prevent slippage of said thermoplastic sheets relative to said sealing jaws, and

said recessed sealing sections being constructed and arranged to simultaneously move with said clamping sections to engage and seal said thermoplastic sheets after said thermoplastic sheets are clamped by said clamping sections.

4,115,183

APPARATUS FOR MAKING BAGS FROM A TWO-PLY WEB OF THERMOPLASTIC MATERIAL

Fritz Achelpohl, and Friedhelm Mundus, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

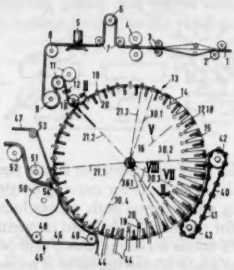
Filed Jul. 15, 1977, Ser. No. 816,033

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632853

Int. Cl.[2] B32B *31/00;* **B30B** *15/34*

U.S. Cl. 156—515 **14 Claims**

1. Apparatus for making bags or tube sections from a continuously supplied two-ply web of heat-sealable or weldable material, comprising a rotary cylinder mounted for rotation about an axis; supporting bars **(19)** for supporting the continuously supplied web positioned at spaced intervals on said rotary cylinder, said supporting bars being radially spaced from the axis of said rotary cylinder, movable towards and away from the periphery of said rotary cylinder, movable towards and away from the periphery of said rotary cylinder, and axially movable between an open position and a blocking position, the supplied web being positionable radially inward of said supporting bars when said supporting bars are in said open position, said supporting bars being movable to said blocking position to retain said supplied web in said radially inward position; transverse welding and separating means for welding the web and for separating the welded web to form bags and comprising backing bars **(15)** and welding bars **(41)** cooperating therewith, said backing bars being positioned on said rotary cylinder between said supporting bars and being displaceable towards and away from said welding bars, the supplied web being positionable radially outward of said backing bars, said supporting and backing bars being movable away



from each other so that the supplied web follows a zig-zag path; and means for taking away the bags formed by the transverse welding and separating means, a first region being defined adjacent said rotary cylinder by a sector defined by radius vectors **(30.2, 30.3)** of the rotary cylinder, said supporting bars being moved away from the backing bars and the web being welded during rotation of said rotary cylinder through said first region, a first cylinder enveloping surface being described by the rotation of said backing bars through said first region, said welding bars being positioned in said first region adjacent said rotary cylinder, being guided to be concentric with the first cylinder enveloping surface, and being adapted to be moved at the same rotational speed as the backing bars.

4,115,184

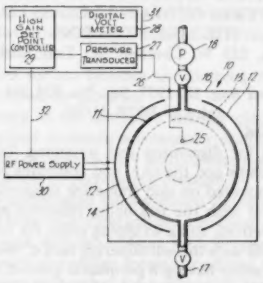
METHOD OF PLASMA ETCHING

Robert Gordon Poulsen, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 29, 1975, Ser. No. 644,911

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—626 **5 Claims**



1. A method of plasma etching in a reaction chamber, comprising:

positioning at least one article in the reaction chamber;

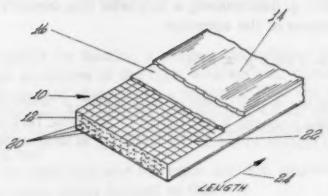
reducing the pressure in the chamber to a predetermined pressure;
switching on the RF power to the reaction chamber;
feeding a preheat gas into the chamber to start the plasma;
measuring the gas temperature in the vicinity of the article and applying a signal, indicative of the variation of said temperature from a predetermined datum, to the RF power supply;
varying the RF power to the chamber in accordance with said signal to bring said temperature to, and maintain said temperature at, said datum;
feeding an etchant gas into said reaction chamber at a predetermined flow rate and pressure for a predetermined time to etch said at least one article while varying the RF power to the chamber in accordance with signals indicative of any variation of said temperature from said datum, to return said temperature to and maintain said temperature at said datum;
switching off the RF power to the reaction chamber after said predetermined time; and
unloading said article.

4,115,185

METHOD OF THERMALLY DIMENSIONALLY STABILIZING A PRINTED CIRCUIT BOARD

Carl S. Carlson, Costa Mesa; Lawrence M. Kinsella, Irvine, and Daniel L. Pixley, Mira Loma, all of Calif., assignors to Diceon Electronics, Inc., Santa Ana, Calif.

Filed Aug. 5, 1977, Ser. No. 822,141
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—634 **13 Claims**



1. A method of thermally dimensionally stabilizing a printed circuit board wherein the printed circuit board has an epoxy fiberglass insulating base and a metal conducting layer bonded to at least one side of the insulating base comprising

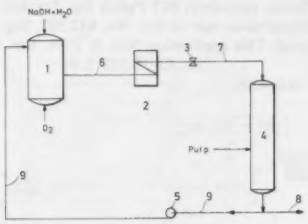
prior to drilling and forming the conductive metal layer into conductive metal path by selective removal thereof, transporting the printed circuit board thru a thermal shocking intense heat source having a temperature of about 425° F to about 450° F for a period of time at least equal to that required to stress relieve the epoxy fiberglass base and promote dimensional movement between the epoxy, fiberglass and metal conducting layer which the printed circuit board would otherwise experience during the subsequent process steps including the shear displacement between the insulating base and conductive metal layer which would otherwise occur after the selective removal of the conductive metal layer to form conductive metal paths and less than the time required for the bonded conductive metal layer to separate from the insulating base, said thermal shocking fluid having a boiling point temperature in excess of 450° F.

4,115,186

PROCESS FOR BLEACHING CELLULOSE PULP WITH MOLECULAR OXYGEN

Frey Viking Sundman, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed May 8, 1974, Ser. No. 468,185
Claims priority, application Finland, May 30, 1973, 1766/73
Int. Cl.[2] D21C *9/10*
U.S. Cl. 162—65 **4 Claims**



1. A process for bleaching cellulose pulp with molecular oxygen in an alkaline medium which comprises the steps of:

(1) dispersing oxygen gas into an alkaline solution under a pressure of up to 50 atmospheres and at a temperature between 0° and 100° C. whereby an oxygen-rich alkali solution is obtained;
(2) heating the oxygen-rich alkaline solution at a temperature between 80° and 130° C., the temperature being so selected within said range, that it is higher than the temperature in step (1);
(3) lowering the pressure of the hot, oxygen-containing, alkaline bleaching solution to a pressure between 0 and 8 atmospheres, said pressure being so selected within said range that it is lower than the pressure in step (1) so as to release oxygen from said alkaline solution;
(4) introducing the hot, oxygen-containing, alkaline solution into a bleaching reactor into contact with the cellulose pulp at a temperature of 80°–130° C. and at a pressure of 0–8 atmospheres to bleach the pulp with the oxygen gas being released from said solution.

4,115,187

AGGLOMERATED FILLERS USED IN PAPER

Richard Robertson Davidson, Cambridge, England, assignor to Welwyn Hall Research Association, England

Continuation-in-part of Ser. No. 379,470, Jul. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 130,507, Apr. 1, 1971, abandoned. This application Feb. 23, 1976, Ser. No. 660,516
Int. Cl.[2] D21H *3/66*
U.S. Cl. 162—168 R **29 Claims**

1. A method of making paper using an acid reactive mineral filler which permits the use of an acid pH, which method comprises:

(a) forming an aqueous dispersion containing at least 30%, by weight, of said reactive mineral filler, wherein the interparticulate water of said dispersion has dispersd therein at least one hydrophilic organic polymer selected from the group consisting of polysaccharides, proteinacious compounds, hydroxylated polymers and alkali solubilized latices, said at least one polymer being capable of being rendered water-insoluble by a chemical isolubilization agent;
(b) treating said dispersion with at least sufficient of said insolubilization agent to form insolubilized polymer and to produce a suspension containing stable agglomerates of filler particles, said particles being held to ether by said insolubilized polymer to form said agglomerates:
(c) intimately blending a filler amount of said suspension

with a papermaking stock to form a blend having an acid pH; and

(d) forming a paper from said blend and recovering said paper.

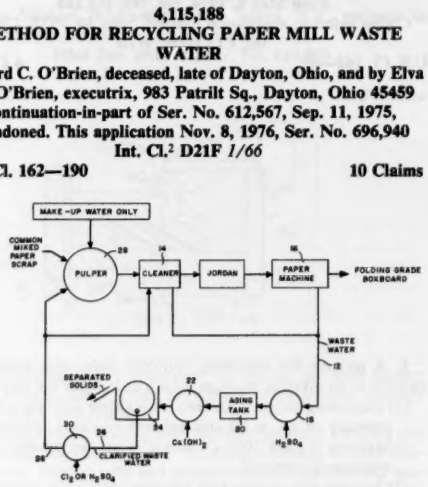
4,115,188
METHOD FOR RECYCLING PAPER MILL WASTE WATER

Richard C. O'Brien, deceased, late of Dayton, Ohio, and by Elva R. O'Brien, executrix, 983 Patrilt Sq., Dayton, Ohio 45459

Continuation-in-part of Ser. No. 612,567, Sep. 11, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 696,940

Int. Cl.[2] D21F *1/66*

U.S. Cl. 162—190 **10 Claims**



1. In a paper-making process a method for treating paper mill waste water to remove the suspended material therein so that the clarified waste water may be reused in the paper-making process, comprising the steps of:

(a) adding a sufficient amount of sulfuric acid to reduce the pH of the waste water to less than 4.0,

(b) mixing thoroughly, then,

(c) adding a sufficient amount of calcium hydroxide to rapidly drive the pH of the acidified waste water to above 10 and cause coagulation of the solid matter in said waste water,

(d) separating the coagulated solid material from the waste water to clarify it, and

(e) treating the clarified waste water to return the pH to approximately neutral.

4,115,189
PAPER MACHINE DRAW ROLL

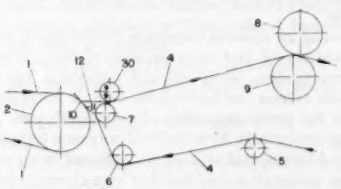
Roland O. Cyrenne, 1570 Lachance St., Sherbrooke, Quebec, Canada (J1J 1B3)

Filed Feb. 16, 1977, Ser. No. 769,351

Claims priority, application Canada, Feb. 20, 1976, 246216

Int. Cl.[2] D21F *1/40, 2/00*

U.S. Cl. 162—305 **2 Claims**



1. In a paper machine having a wet web forming section including a fourdrinier wire entrained about a couch roll, a press section including a continuous felt entrained about a corner roll adjacent said couch roll, the improvement in means for feeding an unsupported wet web of paper from said wire to said felt comprising a draw roll positioned above said corner roll slightly downstream of said corner roll relative to said couch roll, said draw roll having a plurality of axially spaced circumferential grooves in the outer surface thereof, said draw roll being adapted to contact said wet web on said felt.

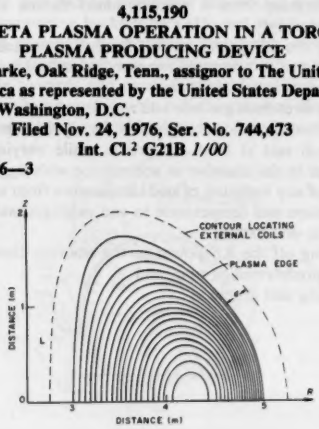
4,115,190
HIGH BETA PLASMA OPERATION IN A TOROIDAL PLASMA PRODUCING DEVICE

John F. Clarke, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,473

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—3 **1 Claim**



1. In a method for producing a plasma in a device of toroidal configuration having poloidal and toroidal magnetic fields provided by respective field windings for confining a toroidal plasma column with a plasma current induced therein along a circular equilibrium axis in a torus vacuum cavity by means of primary ohmic heating windings, and further heating said plasma column by auxiliary heating after the ohmic heating thereof, the improvement comprising the steps of measuring the average plasma pressure, p; determining the magnetic safety factor, q; determining a magnetic flux conserving equilibria by means of the equation:

$$\Delta^*\Psi = -4\pi(R^2p' + FF'),$$

Where R is the major radius of said device, p' is the derivative of the plasma pressure with respect to magnetic flux, and the F function is related to the safety factor, q, as determined by the equation:

$$F = \frac{4\pi^2 q(\psi)}{V' \langle R^{-2} \rangle},$$

where V' is the specific volume between two flux surfaces, and $\langle R^{-2} \rangle$ is the average major radius of the flux surfaces; determining the poloidal magentic field as a function of said equilibria by means of the equation:

$$B_p = i_\phi \times \nabla\Psi/R,$$

where i_ϕ is a vector in the toroidal direction; utilizing said volume and said determined poloidal magnetic field for determining the total current I_w flowing in said plasma based on the relationship:

$$I_w = \frac{V' \langle B_p^2 \rangle}{8\pi},$$

where $\langle B_p^2 \rangle$ is a flux surface average of the poloidal field at the plasma surface; and finally controlling the respective current flow to respective ones of said poloidal field windings such that the total current flow to said poloidal field windings is equal and opposite to said total plasma current I_w, the distri-

bution of the current to the poloidal field windings being determined by the expression;

$$K = \frac{n \times B_p}{4\pi},$$

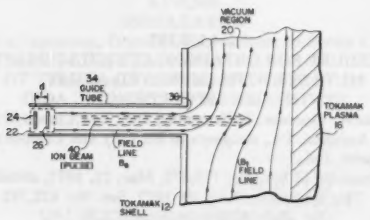
where K is the current density per unit length on the surface containing the poloidal field windings and n is a unit vector normal to this surface; and repeating all of the above steps for each measured value of said pressure which increases during the heating of said plasma by means of said auxiliary heating whereby a magnetic flux conserving equilibrium is maintained during all stages of operation of said method and the beta which is directly related to said pressure will ultimately reach a high value, thus ultimately providing a substantially high neutron production rate which is a function of the square of the beta.

4,115,191

TOKAMAK PLASMA HEATING WITH INTENSE, PULSED, ION BEAMS

Edward Ott, Ithaca, N.Y., and Wallace M. Manheimer, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,382
Int. Cl.² G21B *1/00*
U.S. Cl. 176—3 **3 Claims**



1. Apparatus for heating a plasma, said plasma being confined in an apparatus of the type wherein said plasma is confined in a vacuum chamber by a magnetic field and a vacuum region is formed surrounding said plasma, which comprises:

means for producing a space-charge-neutralized, pulsed, ion beam; and

means for directing said ion beam into the magnetic field, said ion beam being formed so that

the square of the ion frequency of said beam is very much larger than the square of the gyrofrequency of said beam in the magnetic field, thereby producing a polarization electric field in said beam when it enters the magnetic field, said polarization field enabling said beam to propagate across the vacuum region,

the velocity of said beam is greater than the Alfven speed of said beam in the magnetic field so that said beam will penetrate said plasma,

and the velocity of said beam is less than $2\sqrt{2}$ times the Alfven speed of said beam in the magnetic field so that said beam will deposit its energy in the interior of said plasma.

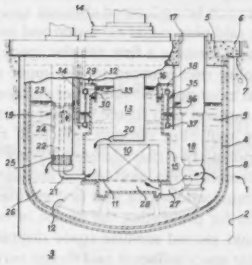
4,115,192

FAST NEUTRON NUCLEAR REACTOR

Patrick Jogand, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 6, 1977, Ser. No. 813,324
Claims priority, application France, Jul. 6, 1976, 76 20652
Int. Cl.² G21C *15/18*
U.S. Cl. 176—40 **3 Claims**

1. A fast neutron nuclear reactor comprising on the inside a main vessel having a vertical axis suspended by its upper open part on a thick protective slab which seals a cavity surrounding said vessel, a volume of a liquid cooling metal and also positioned within said main vessel an inner vessel having a cylindrical wall containing the core of the reactor submerged beneath the liquid metal level, the intermediate space between the main vessel and the inner vessel having heat exchangers and pumps which pass below the level of the liquid metal, wherein the upper end of the inner vessel is covered by an inverted annular bell cap and is placed under the internal pressure of a neutral



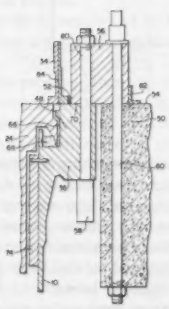
gas in order to prevent in normal operation direct communication between the hot liquid metal within the inner vessel and the cold liquid metal in the annular space between the main vessel and the inner vessel, said bell cap covering an auxiliary exchanger which externally surrounds the inner vessel in such a way that if there is a fault in the reactor and after reducing the neutral gas pressure beneath the bell cap as a result of natural convection a circulation of the liquid metal takes place beneath the bell cap of the inner vessel towards the annular space and passes through the auxiliary exchanger.

4,115,193

NUCLEAR REACTOR PRESSURE VESSEL SUPPORT SYSTEM

George R. Sepelak, McMurray, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 571,836, Apr. 25, 1975, abandoned.
This application Aug. 17, 1976, Ser. No. 715,255
Int. Cl.² G21C *13/06*
U.S. Cl. 176—87 **4 Claims**



1. A nuclear reactor pressure vessel support system comprising:

a generally cylindrical nuclear reactor pressure vessel having a fluid contained therein;

a pressure vessel flange around the upper periphery of said pressure vessel, said flange having an annular vertical

extension formed integral therewith, said vertical extension having width less than the radial width of said flange;

a containment well radially surrounding said pressure vessel, said well having a containment support ledge thereon adjacent said flange extension;

a support ring located on the upper surface of, and secured to, said flange vertical extension and said containment support ledge;

a rotatable plug positioned within said pressure vessel, said rotatable plug having a radial extension formed integral therewith around the outer periphery thereof, said plug radial extension being located adjacent said flange vertical extension, said plug radial extension and said flange vertical extension forming a first annular space therebetween;

an annular plug riser secured to the upper surface of said plug radial extension and the upper surface of said flange vertical extension, said flange vertical extension rotatably supporting said plug through said plug riser, said plug riser comprising two riser elements having a second annular space therebetween, said second annular space being in fluid communication with said first annular space; and

sealing means for preventing the escape of contained fluids through said second annular space disposed within said first annular space adjacent said flange vertical extension, said sealing means preventing the escape of contained fluids through the joint formed by said flange vertical extension and said support ring.

4,115,194

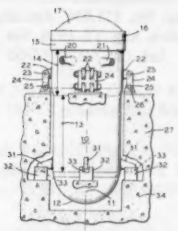
REACTOR PRESSURE VESSEL SUPPORT

James Paul Butti, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,965

Int. Cl.² G21C *13/00*

U.S. Cl. 176—87 **3 Claims**



1. The combination comprising a generally cylindrical nuclear reactor pressure vessel having a longitudinal axis, a plurality of radially projecting lugs attached to and spaced circumferentially about said pressure vessel, a support foundation, a plurality of base plates attached to said foundation, and a plurality of links disposed parallel to the longitudinal axis and a plurality of pins disposed laterally to the longitudinal axis, said links and pins being arranged at circumferentially spaced intervals so that one of said pins pivotably connects one end of a link to one of said lugs and another of said pins pivotably connects said link at its other end to a base plate forming link and pin supporting arrangements at circumferentially spaced intervals such that the pressure vessel is longitudinally supported and restrained from longitudinal, lateral and rotary movement by said link and pin supporting arrangements.

4,115,195

RABIES VACCINE PREPARATION

Rudolph Barth, Marburg, Lahn, and Oskar Jaeger, Niederwetter, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,766

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616407

Int. Cl.² C12K *7/00*; A61K *39/28*; C12K *5/00*

U.S. Cl. 195—1.3 **4 Claims**

1. In a process for preparing a rabies vaccine, the improvement wherein the rabies virus is first adapted to chick-embryo fibroblast cell cultures using a suspension containing the rabies virus in progressing dilutions from 10^{-1} to 10^{-5} for the inoculation of the cell culture passages and then inoculating growth cultures with a suspension containing the adapted rabies virus in a dilution from 10^{-2} to 10^{-5} for multiplication of the virus.

4,115,196

Patent Not Issued For This Number

4,115,197

PROCEDURE FOR OBTAINING PENICILLIUM SPECIES MUTANTS WITH IMPROVED ABILITY TO SYNTHESIZE MYCOPHENOLIC ACID

Stephen W. Queener, Indianapolis, Ind., and Claude H. Nash, III, Audubon, Pa., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 779,670, Mar. 21, 1977, abandoned. This application Aug. 29, 1977, Ser. No. 828,392

Int. Cl.² C12D *9/06, 9/10*; C12K *1/02*

U.S. Cl. 195—36 R **8 Claims**

1. A method for efficiently obtaining higher mycophenolic-acid-producing strains of Penicillium, which consists of mutating a mycophenolic-acid-producing Penicillium strain, exposing the mutated population to a polyene antibiotic and screening the polyene-antibiotic-resistant strains for mycophenolic acid production.

4,115,198

METHOD OF IMMOBILIZATION OF BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES INCLUDING ENZYMES

Robert W. Coughlin, 49 Storrs, Heights Rd., Conn. 06268; Marvin Charles, 622 N. 29 St., Allentown, Pa. 18104, and Billy R. Allen, 2034 Dublin-Granville Rd., Columbus, Ohio 43229

Continuation-in-part of Ser. No. 441,572, Feb. 11, 1974, abandoned. This application Jul. 8, 1976, Ser. No. 703,670

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **9 Claims**

1. A method of preparing water-insoluble enzymes comprising the steps:

(a) precipitating a hydrous metal oxide from a solution of a salt of said metal in the presence of an insoluble support material so as to form a coating of the said oxide on the said support,

(b) washing the composite support material resulting from step *a*,

(c) contacting the composite support material resulting from step *b* with a solution of an enzyme so as to immobilize said enzyme on said support material.

4,115,199
PREPARATION OF CULTURE CONCENTRATES FOR DIRECT VAT SET CHEESE PRODUCTION

Randolph S. Porubcan, West Allis, and Robert L. Sellars, Waukesha, both of Wis., assignors to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

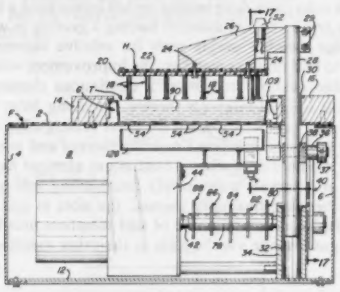
Filed May 4, 1977, Ser. No. 793,483
Int. Cl.[2] C12K *3/00;* **C12B** *1/26;* **A23C** *19/02, 23/00*
U.S. Cl. 195—96 **11 Claims**

1. The method of preparing concentrated bacterial cultures for direct vat inoculation of milk batches in which harmless lactic acid-producing bacteria are cultured in an aqueous medium including fermentation nutrients to obtain a fermented aqueous culture of the bacteria cells together with residual nutrients including casein, wherein the improvement comprises recovering and concentrating said cells by subjecting said culture to centrifugation while having dissolved therein from 0.25 to 5.0% based on the weight of the culture of water-soluble food-acceptable polyphosphate salt selected from the class consisting of tripolyphosphate and hexametaphosphate containing from 4 to 22 phosphate groups per molecule, said centrifugation producing a cell concentrate of said bacteria having in excess of 50×10^9 CFU per gram.

4,115,200
INOCULATOR

Joseph A. Anderson, Denver, Colo., assignor to Benny F. Mertens, Denver, Colo., a part interest

Filed Aug. 9, 1976, Ser. No. 712,685
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—127 **9 Claims**



1. An inoculator for placing discrete amounts of inoculum into each of a plurality of wells in an antibiotic plate, said inoculator comprising:

a support for alternatively holding a tray containing a quantity of inoculum therein and an antibiotic plate having wells therein, wherein each well contains broth and/or antibiotics, said support having a plurality of spaced openings therein;

means for positioning either the inoculum tray or the antibiotic plate on said support;

a head mounted above said support for reciprocal movement toward and away from said support;

a plurality of transfer loops depending from one side of said head and aligned with said opening in said support for being dipped selectively in the inoculum tray and in the respective wells of the antibiotic plate when said head is moved toward said support; to cause inoculum on said transfer loops to be placed in the wells of the antibiotic plate in discrete amounts.

means for causing said head to reciprocally move from a first position spaced from said support to a second position wherein said transfer loops are selectively dipped in the inoculum tray and in the respective wells of the antibiotic plate and a third position wherein said transfer loops extend through said spaced openings in said support for sterilization of said transfer loops; and

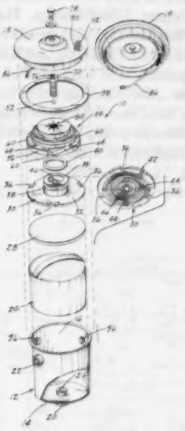
means for causing inoculum on said transfer loops to be placed in the wells of the antibiotic plate in discrete amounts; and

tray means located below said support in which said rows of transfer loops are simultaneously sterilized by resistance heating while said head is in said third position with said transfer loops extending through said openings in said support.

4,115,201
OIL RECLAIMER

Jerry P. Malec, 10524 E. Pine, Tulsa, Okla. 74116

Filed Jun. 25, 1976, Ser. No. 699,938
Int. Cl.[2] B01D *3/28, 35/18;* **C10G** *7/00*
U.S. Cl. 196—46.1 **8 Claims**



1. An apparatus for removing impurities from lubricating oil, comprising,

a container having upper and lower ends,

said container having an oil inlet opening formed in its lower end for receiving the oil,

a filter material in the lower end of said container,

a redistribution plate means within said container above said filter material,

an evaporator plate means within said container above said redistribution plate means and having a diameter substantially equal to the diameter of said container to define a vaporization chamber thereabove, said evaporator plate means having upper and lower ends,

said redistribution plate means having oil redistribution means on the lower end for causing the oil adjacent thereto to be moved towards the center of said redistribution plate means, and thence upwardly through a central opening formed therein,

said evaporator plate means having a central opening formed therein extending between its upper and lower ends whereby the oil moved to the center of the lower end of said redistribution plate means will pass upwardly through said central opening of said evaporator plate means,

said evaporator plate means having a plurality of annular concentric tiers provided on its upper end whereby the oil passing through the upper end of said central opening of

said evaporator plate means will flow downwardly and outwardly over said concentric tiers,

a ring-shaped heating element positioned in said container and extending around the upper end of said evaporator plate means at the periphery thereof for heating the oil passing downwardly over said concentric tiers,

a cover means extending over the upper end of said container,

and means for conducting oil from the upper ends of said container,

said oil redistribution means comprising a plurality of concentric grooves formed in the lower end of said redistribution plate means and a plurality of radially extending grooves formed in the lower end of said redistribution plate means which communicate with said concentric grooves and which extend from the outermost concentric groove to the center of said redistribution plate means for communication with said central opening in said redistribution plate means.

4,115,202

APPARATUS FOR PRODUCING NON-ABRASIVE COKE FORMS FROM BROWN-COAL BRIQUETS

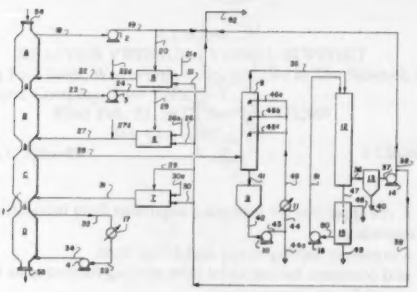
Kurt Lorenz, Hattingen; Horst Dungs, Herne; Peter Speich, Cologne, and Roman Kurtz, Frechen, all of Fed. Rep. of Germany, assignors to Firma Carl Still and Rheinische Braunkohlenwerke Aktiengesellschaft, both of, Fed. Rep. of Germany

Continuation of Ser. No. 706,542, Jul. 19, 1976, abandoned, which is a division of Ser. No. 660,153, Feb. 23, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,645

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507735; Aug. 21, 1975, 2537191

Int. Cl.[2] C10B *1/04, 3/02, 21/02*

U.S. Cl. 202—99 **4 Claims**



1. In apparatus for producing non-abrasive coke forms from brown coal briquettes, of the type in which the brown coal briquettes are preheated, dehydrated or dried, carbonized and subsequently cooled in an oven in at least three respective stages, and including gas recirculating circuits for recirculating gas consisting essentially of combustion lean gas obtained from carbonization of the brown coal briquettes, with the gas in the recirculating circuits for the carbonization being heated and the gas in the recirculating circuits for the cooling being cooled, the improvement wherein said oven comprises four oven chambers arranged in superposed aligned relation and including a preheating chamber, a dehydrating chamber, a carbonization chamber and a cooling chamber; each chamber having conically converging upper and lower ends; means interconnecting the conically converging ends of adjacent chambers, said interconnecting means and said conically converging ends defining transition zones between said oven chambers, the cross-sectional area of each of said transition zones decreasing from one chamber toward the next subjacent chamber to approximately one-half the cross-sectional area of the superjacent chamber and then increasing to the full cross-sectional area of the subjacent oven chamber; respective gas inlets for each oven chamber provided around the entire periphery of the conically converging lower end thereof; respective gas outlets for each oven chamber provided around the entire periphery of the conically converging upper end thereof; respective means connecting the gas outlet of each chamber to the gas inlet thereof to provide, for each chamber, a primary gas recirculating circuit respective to only that chamber and separate from the primary gas recirculating circuits respective to the other chambers; respective combustion chambers, supplied with such combustion lean gas and with air, connected in the primary gas recirculating circuits of said pre-heating and dehydrating chambers for separately heating the respective gases recirculating therein; and respective dust settling receptacles provided immediately adjacent the gas outlets of said oven chambers and surrounding the transition zones interconnecting said oven chambers; said dust settling receptacles effecting separate dedusting of the recirculating gases of the respective oven chambers while reducing the flow velocity of the respective recirculating gases to substantially 0.2 to 2.0 m/sec.

4,115,203

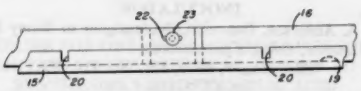
SEAL FOR COKE OVEN DOORS

Roy Naevestad, Fanwood, N.J., assignor to Wilputte Corporation, New Providence, N.J.

Filed Jan. 6, 1977, Ser. No. 757,378

Int. Cl.[2] C10B *25/06, 25/18*

U.S. Cl. 202—248 **9 Claims**



1. In a coke oven door sealing means comprising a knife edge member and a retainer member having a groove in which said knife edge member snugly seats for relative movement with respect to said retainer member, the improvement wherein said knife edge member comprises a continuous element having transverse slots at intervals therein extending from the inner edge thereof part way toward the outer sealing edge thereof to provide edgewise bending flexibility thereof and wherein said retainer member comprises a continuous element having slots therein at intervals transversely intersecting said groove to provide bending flexibility thereof, the slots in said members being displaced whereby one of said members provides a seal against gas leakage via the slots in the other member.

4,115,204

SEPARATION OF PHENOL-, CYCLOHEXANONE-, AND CYCLOHEXYLBENZENE-CONTAINING MIXTURES EMPLOYING AN N,N-DISUBSTITUTED AMIDE

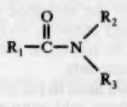
Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1977, Ser. No. 817,764

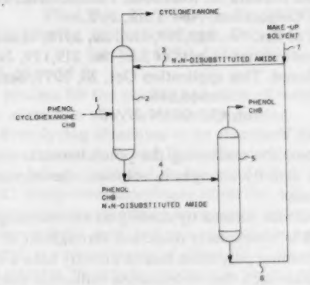
Int. Cl.[2] B01D *3/40;* **C07C** *39/04, 45/24*

U.S. Cl. 203—60 **3 Claims**

1. An extractive distillation of a mixture containing phenol and cyclohexanone, which mixture may also contain cyclohexylbenzene, which comprises distilling said mixture in the presence of a solvent comprising at least one N,N-disubstituted amide which contains up to 30 carbon atoms and can be represented by the following general formula



wherein R_1, R_2, and R_3 are each selected from the group consisting of alkyl radicals containing 1 to 20 carbon atoms, cycloalkyl radicals containing 5 to 20 carbon atoms, aryl or substituted aryl radicals containing 6 to 12 carbon atoms with the



substituent groups being one or more or a mixture of alkyl, alkoxy, cycloalkyl, halogen, or the like, and aralkyl radicals containing 7 to 12 carbon atoms, the N,N-disubstituted amide solvent selected has a boiling point above the boiling point of phenol (812° C. at atmospheric pressure), and mixtures thereof.

4,115,205

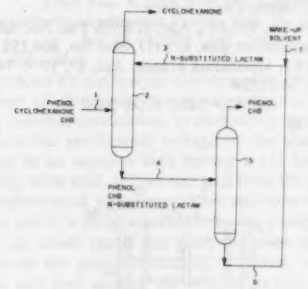
SEPARATION OF PHENOL-, CYCLOHEXANONE-, AND CYCLOHEXYLBENZENE-CONTAINING MIXTURES EMPLOYING AN N-SUBSTITUTED LACTAM

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1977, Ser. No. 817,768

Int. Cl.[2] B01D *3/40;* **C07C** *39/04, 45/24*

U.S. Cl. 203—60 **4 Claims**



1. An extractive distillation of a mixture containing phenol and cyclohexanone, which mixture may contain cyclohexylbenzene, which comprises distilling said mixture in the presence of a solvent comprising at least one N-substituted lactam.

4,115,206

SEPARATION OF PHENOL-, CYCLOHEXANONE-, AND CYCLOHEXYLBENZENE-CONTAINING MIXTURES EMPLOYING AN ORGANIC CARBONATE

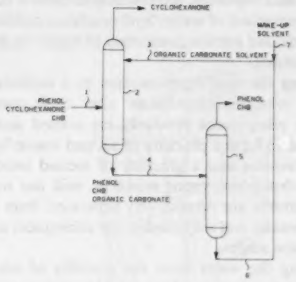
Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1977, Ser. No. 817,883

Int. Cl.[2] B01D *3/40;* **C07C** *39/04, 45/24*

U.S. Cl. 203—60 **4 Claims**

1. An extractive distillation of a mixture containing phenol and cyclohexanone, which mixture may contain cyclohexylbenzene, which comprises distilling said mixture in the presence of a solvent comprising an organic carbonate containing up to 30 carbon atoms.



4,115,207

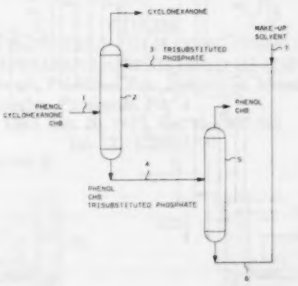
SEPARATION OF PHENOL-, CYCLOHEXANONE-, AND CYCLOHEXYLBENZENE-CONTAINING MIXTURES EMPLOYING A TRISUBSTITUTED PHOSPHATE

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 27, 1977, Ser. No. 819,422

Int. Cl.[2] B01D *3/40;* **C07C** *39/04, 45/24*

U.S. Cl. 203—60 **4 Claims**



1. An extractive distillation of a mixture containing phenol and cyclohexanone, which mixture may contain cyclohexylbenzene, which comprises distilling said mixture in the presence of a solvent comprising a trisubstituted phosphate boiling above phenol and containing up to 30 carbon atoms.

4,115,208

RECOVERY OF STYRENE FROM CRACKED HYDROCARBON FRACTIONS

Johannes D. M. Verstegen, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 716,355, Aug. 20, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,883

Claims priority, application Netherlands, Aug. 25, 1975, 7509991

Int. Cl.[2] B01D *3/14;* **C07C** *15/10;* **C10G** *9/44*

U.S. Cl. 203—81 **6 Claims**

1. In a process for recovering styrene from the reaction products of the thermal cracking of hydrocarbons wherein hydrocarbons mixed with steam are directly heated and cracked, which process comprises the steps of,

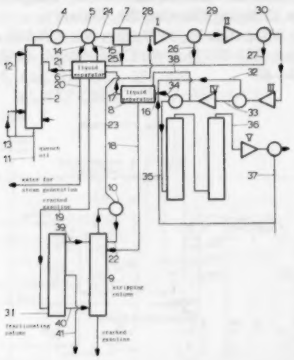
(1) quenching and fractionating the reaction products into a liquid bottom fraction comprises predominantly of hydro-

carbons with nine or more carbon atoms and a vaporous top fraction comprised predominantly of hydrocarbons with less than 9 carbon atoms and water vapor,

(2) cooling said vaporous top fraction to form a condensed portion comprised of water/hydrocarbon condensate, and an uncondensed portion comprised of water/hydrocarbon vapor mixture,

(3) subjecting the said vapor mixture to a multistage compression, wherein immediately after each compression stage the compressed products are cooled and in part condensed to form a plurality of second water/hydrocarbon condensates and a plurality of second uncondensed water/hydrocarbon vapor mixtures, said last mentioned vapor mixtures are respectively separated from said second condensate and subjected to the subsequent sequential compression stages,

(4) separating the water from the plurality of said second water/hydrocarbon condensates obtained in step (3) to form a plurality of dehydrated hydrocarbon condensates and passing said dehydrated hydrocarbon condensates to a stripping column,



(5) removing the water from the water/hydrocarbon condensate of step (2) to form a dehydrated hydrocarbon condensate,

(6) passing said dehydrated hydrocarbon condensate of step (5) to the stripping column of step (4), and

(7) stripping said dehydrated hydrocarbon condensates of steps (4) and (5) in said stripping column, the improvement consisting essentially of the combination of the additional steps prior to any introduction of said dehydrated hydrocarbon condensate obtained in step (5)

(A) passing said dehydrated hydrocarbon condensate of step (5) to a fractionating column and fractionating said dehydrated hydrocarbon condensate of step (5), whereby there is separately obtained:

(i) a first fraction having 8-carbon-atom hydrocarbons,

(ii) a second fraction having less-than-8-carbon-atom hydrocarbons, and

(iii) a third fraction having more-than-8-carbon atom hydrocarbons,

(B) thereafter recovering styrene from said first (i) fraction.

4,115,209

METHOD OF DETERMINING ION ACTIVITY USING COATED ION SELECTIVE ELECTRODES

Henry Freiser, Tucson, Ariz.; Helen J. James, Ogden, Utah; Gary Carmack, Tuscon, Ariz.; Robert W. Cattrall, Victoria, Australia, and Barbara M. Kneebone, Tucson, Ariz., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 519,297, Oct. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 219,119, Jan. 19, 1972, abandoned. This application Oct. 20, 1977, Ser. No. 844,146

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **7 Claims**

1. In a process for measuring the potentiometric responses caused by ion activity changes in solution, the improvement which comprises:

using an electrode formed by coating an ion exchange material which is molecularly dispersed throughout an insoluble film-forming polymeric matrix directly onto a conductive substrate such that an oxidation-reduction mechanism is not operative in the response of said electrode to the activity of ions in said solutions.

4,115,210

METHOD OF ELECTROLYTICALLY PREPARING A METAL IN PULVERULENT FORM

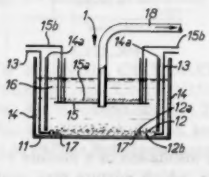
Roger Dekeister; Gilbert Lemaire, and Daniel Marzys, all of Auby-lez-Douai, France, assignors to Compagnie Royale Asturienne des Mines, Paris, France

Division of Ser. No. 566,111, Apr. 8, 1975, Pat. No. 4,064,033. This application Jun. 6, 1977, Ser. No. 804,152

Claims priority, application France, Apr. 12, 1974, 74 12912; May 29, 1974, 74 18539

Int. Cl.[2] C25C *5/00, 5/02*

U.S. Cl. 204—10 **1 Claim**



1. A process for electrolytically precipitating a pulverulent metal from a compound of the metal in an ionized solution, comprising establishing said ionized solution in an electrolytic cell using as a cathode for said cell a bed of powder of said metal, the grain size of said powder being substantially that of the particles to precipitate out of said ionized solution, passing the electrical current through said cathode and an anode immersed in said solution while said bed lies quiescent thereby to cause particles of said metal to precipitate electrolytically and to collect onto said bed of powder, intermittently agitating said bed to suspend said bed in said solution, and intermittently withdrawing a portion only of said suspended particles from said cell, the remainder of said particles then settling to the bottom of said cell to constitute again said cathode.

4,115,211
PROCESS FOR METAL PLATING ON ALUMINUM AND ALUMINUM ALLOYS

Takeo Tsukamoto; Miyoshi Okamura, and Toshio Kutami, all of Tokyo, Japan, assignors to Nihon Kagaku Sangyo Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,555
Claims priority, application Japan, Dec. 26, 1975, 50-154818
Int. Cl.[2] C25D *5/44, 5/50*
U.S. Cl. 204—37 R 14 Claims

1. A process for the electrodeposition of metal on an aluminum or aluminum alloy substrate comprising:

(a) electrolyzing aluminum or an aluminum alloy by A.C. or superimposed A.C. and D.C., the aluminum or aluminum alloy being connected as the anode with respect to the D.C. component superimposed on the A.C., in an electrolytic solution comprising an aqueous solution containing a water-soluble acid and a water-soluble salt of a heavy metal, at a temperature of about 20° C for about from 5 to 30 minutes, thereby to produce an anodic oxide coating of said heavy metal onto the surface of the aluminum or aluminum alloy so as to impart good adhesion properties to the aluminum or aluminum alloy and render it suitable as a substrate for the electrodeposition of additional metal thereon;

(b) electrodepositing at least one additional metal on the thus-electrolyzed aluminum or aluminum alloy substrate; and

(c) heating the resulting aluminum or aluminum alloy substrate carrying the electrodeposited additional metal thereon to enhance the adhesion between the substrate and the additional metal.

4,115,212
ELECTROLYTIC COLORING PROCESS FOR NON ANODIZED ALUMINUM AND ITS ALLOYS

Jos Patrie, Grenoble, and Gabriel Colombier, Saint Egreve, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Feb. 9, 1978, Ser. No. 876,356
Claims priority, application France, Feb. 11, 1977, 77 04639
Int. Cl.[2] C25D *5/30, 5/48*
U.S. Cl. 204—38 E 14 Claims

1. A process for electrolytic coloring of objects of aluminum and alloys of aluminum comprising subjecting the objects, without previous anodization, to alternating current, at a voltage below the anodization voltage of the aluminum, while immersed in an aqueous bath having a pH less than 2 and containing boric acid, at least one acid from the group consisting of sulfuric acid, sulfamic acid and mixtures thereof, and at least one salt of a metal selected from the group consisting of copper, tin, silver, nickel and gold, the anion of which is selected from the group consisting of sulfate, sulfamate and chloride, and then coating the colored surface of the object with a colorless varnish.

4,115,213
ELECTRODEPOSITION PROCESS & APPARATUS

Kenji Ogisu, and Masahisa Enomoto, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 860,884
Claims priority, application Japan, Dec. 17, 1976, 51/152744
Int. Cl.[2] C25D *3/66;* C25C *3/00*
U.S. Cl. 204—39 20 Claims

1. An electrodeposition process comprising the steps of:

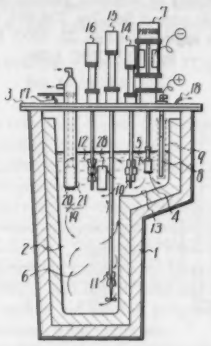
(a) preparing a fused salt electrolytic bath containing a salt of a metal to be electrodeposited or of constituent metals of an alloy to be electrodeposited;

(b) providing cathode and anode electrodes within said electrolytic bath;

(c) providing a cooling drum within said electrolytic bath for deposition of solid particles of said salt thereon;

(d) scraping the solid salt particles deposited on the surface of said cooling drum off said cooling drum;

(e) dispersing said salt particles scraped off said cooling drum throughout said electrolytic bath; and

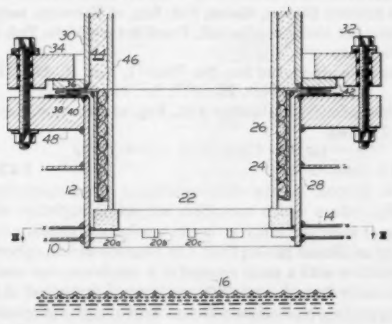


(f) electrodepositing the desired metal or alloy on said cathode electrode from said electrolytic bath containing dispersed said salt particles therein.

4,115,214
FUSED BATH CELL LID HAVING CORROSION PROTECTION MEANS AND METHOD OF USING SAME

Robert L. Hargis, Palestine, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 20, 1977, Ser. No. 807,963
Int. Cl.[2] C25C *3/00*
U.S. Cl. 204—64 R 5 Claims

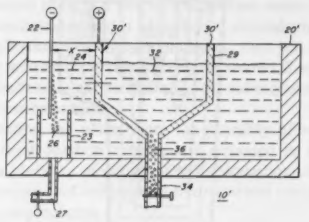


1. A method for exhausting a substance through a port in a lid of a chamber, comprising conducting the substance through a tube within the port, the substance being at a temperature such that it would corrode the port but for the containment of the substance within the tube, the tube being more resistant to corrosion bythe substance than is the port, supporting the tube on a support means extending into the interior of the port, the substance being able to corrode the support means at said temperature, and cooling at least a tube-supporting minimum of said support means sufficiently below said temperature such that said minimum remains uncorroded for supporting said tube.

4,115,215
ALUMINUM PURIFICATION

Subodh K. Das, Natrona Heights; C. Norman Cochran, Oakmont; Richard A. Milito, Natrona; Robert M. Mazgaj, and Walter W. Hill, both of Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 725,482, Sep. 22, 1976, abandoned. This application Feb. 23, 1977, Ser. No. 771,100
Int. Cl.[2] C25C *3/06*
U.S. Cl. 204—67 11 Claims



1. A process for purifying aluminum alloy comprising:
(a) providing the aluminum alloy in a molten state in a container having a porous membrane therein, said porous membrane being capable of containing molten aluminum in the container and being permeable by a molten electrolyte; and
(b) electrolytically transferring aluminum through said porous membrane to a cathode in the presence of the electrolyte, the transferring effected at a current density of greater than 200 amps/ft^2 and characterized by depositing substantially all of the aluminum transferred through the porous membrane at the cathode, thereby substantially purifying said aluminum by separating it from its alloying constituents.

4,115,216
PROCESS FOR THE ELECTROCHEMICAL DIHYDROGENATION OF NAPHTHYL ETHERS

Detlev Herbert Skaletz, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

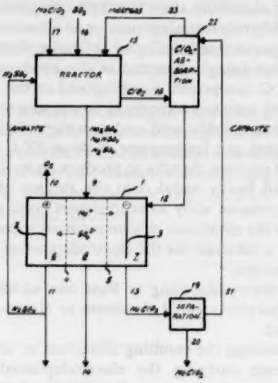
Continuation-in-part of Ser. No. 790,671, Apr. 25, 1977. This application Nov. 28, 1977, Ser. No. 855,355
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743762
Int. Cl.[2] C25B *3/04, 11/04, 11/12*
U.S. Cl. 204—73 R 9 Claims

1. A process for the electrochemical dihydrogenation of naphthyl ethers which comprises subjecting naphthyl ethers having at least one ether group in a solvent consisting essentially of an alkanol having from 1 to 3 carbon atoms, optionally in admixture with a small amount of a cosolvent, and containing no more than about 5 % by volume of water and at least one supporting electrolyte selected from the group consisting of
tetramethylammonium salt
tetraethylammonium salt
tetramethylammonium hydroxide
tetraethylammonium hydroxide
tetramethylphosphonium salt
tetraethylphosphonium salt
tetramethylphosphonium hydroxide and
tetraethylphosphonium hydroxide as a catholyte to electrolysis in a continuous flow diaphragm cell using a solid cathode having a more cathodic hydrogen overvoltage than that of Cu, and the usual solids an anode material, at temperatures of from −20° to +120° C, and at a pH of at least about 8.

4,115,217
PROCESS FOR ELECTROLYTIC PREPARATION OF CHLORITES

Karl-Georg Larsson, Trollhättan, and Maria Norell, Ljungaverk, both of Sweden, assignors to Kemanord AB, Stockholm 11, Sweden; Kemanord AB, Stockholm 11, Sweden and Kemanord AB, Stockholm, Sweden

Filed May 6, 1977, Ser. No. 794,698
Claims priority, application Sweden, May 11, 1976, 7605373
Int. Cl.[2] C25B *1/36;* C01B *11/10*
U.S. Cl. 204—95 7 Claims



1. The process which comprises
(a) reacting an alkali or alkali earth metal chlorate with a reducing agent under acid conditions in a reaction zone to thereby form chlorine dioxide and a residual aqueous solution containing alkali or alkali earth metal ions,
(b) providing an electrolytic cell comprising an anode, a cathode and a cation selective membrane positioned between said anode and said cathode, said electrolytic cell being separate from said reaction zone,
(c) withdrawing said residual solution from said reaction zone and introducing it into said electrolytic cell on the anode side of said cation selective membrane,
(d) withdrawing the chlorine dioxide formed in said reaction zone and feeding this chlorine dioxide to the cathode side of the cation selective membrane of the cell,
(e) electrolytically producing hydrogen ions at said anode,
(f) withdrawing from the anode side of said cation selective membrane of said cell a solution which has, in relation to said residual solution, a decreased concentration of alkali or alkali earth metal ions,
(g) feeding at least a part of the solution withdrawn from the cell according to step (f) to said reaction zone,
(h) electrolytically reducing the chlorine dioxide to chlorite at said cathode, and
(i) withdrawing alkali or alkali metal chlorite from the cathode side of said cation selective membrane of said cell.

4,115,218
METHOD OF ELECTROLYZING BRINE

Michael Krumpelt, Riverview, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 22, 1976, Ser. No. 735,115
Int. Cl.[2] C25B *1/16, 1/26, 13/08, 15/08*
U.S. Cl. 204—98 8 Claims

1. A process for electrolyzing sodium chloride brine in an electrolytic cell having a dimensionally stable anode, a cathode, and between said anode and said cathode a membrane of copolymerized tetrafluoroethylene and perfluorovinylether sulfonylfluoride having an equivalent weight number of approximately 1000 to 1500 and a thickness of approximately 0.1 to 0.5 millimeters,

said process involving the electrolysis of brine containing a membrane obstructing proportion of calcium not exceeding 6 parts per million of calcium,

said process including the use at intervals of approximately once per month or less frequently of a voltage-reduction action,

said voltage-reduction action comprising reducing the current through said electrolytic cell for a period of 0.5 to 90 minutes to a value of less than 20 percent of the current normally used.

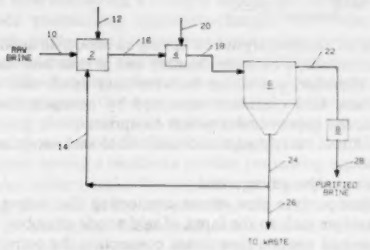
4,115,219
BRINE PURIFICATION PROCESS

Alan B. Gancy, and Chester J. Kaminski, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 653,874, Jan. 30, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,016

Int. Cl.² C25B *1/36*

U.S. Cl. 204—99 **11 Claims**



1. In a brine treatment process for removing dissolved strontium, calcium and magnesium impurities from a raw sodium chloride brine containing the same wherein the raw brine is contacted with sodium carbonate for formation of strontium carbonate and calcium carbonate solids, the brine containing the carbonate solids is contacted with sodium hydroxide for formation of magnesium hydroxide solids, and at least a major portion of said strontium carbonate, calcium carbonate and magnesium hydroxide solids is removed from the brine to produce a purified brine, and the brine is thereafter subjected to electrolysis in an electrolytic mercury cell, the improvement which comprises recycling said removed solids, in an amount of from about 25 to 1000% of the solids produced, for admixture with said raw brine and sodium carbonate.

4,115,220
PROCESS FOR THE PREPARATION OF HIGH PURITY ANTIMONY

Günter Bartels, Wildemann; Horst Immenroth, Langelsheim, and Günter Heyer, Goslar, all of Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft Metall, Goslar, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,836

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715150

Int. Cl.² C25C *1/22*

U.S. Cl. 204—105 R **6 Claims**

1. A process for the preparation of high purity antimony comprising:

(a) hydrolyzing antimony(III) chloride with ammonium hydroxide to produce a precipitate of antimony(III) oxide;

(b) dissolving the antimony(III) oxide precipitate in an aqueous solution of d-sorbitol and a base; and

(c) subjecting the solution from step (b) to electrolysis using an insoluble anode.

4,115,221
ACID FERRIC SULFATE LEACHING OF COPPER SULFIDE CONCENTRATES

Milton E. Wadsworth, 3437 S. 13th E.; Jan D. Miller, 1886 Atkin Ave., both of Salt Lake City, Utah 84106; John A. Herbst, 640 Parkview, Park City, Utah 84060; John L. Kolbe, Clarksville, Md. 21029, and Howard Wayne Hayden, Columbia, Md. 21043

Filed Feb. 28, 1977, Ser. No. 772,944

Int. Cl.² C25C *1/12*

U.S. Cl. 204—108 **9 Claims**

1. A process for removing copper from copper sulfide bearing materials comprising the steps of:

fine-grinding copper sulfide-bearing materials to a particle size of at most one micron;

leaching said finely-ground copper sulfide-bearing material in an acidic solution containing a stoichiometric amount of ferric ions to oxidize the copper ions contained in the copper sulfide-bearing material and form a pregnant leach solution containing said copper ions and ferrous ions;

separating said copper ion-bearing pregnant leach solution from any remaining solid materials;

crystallizing iron salts in the pregnant leach solution;

electrolyzing the pregnant leach solution and ferrous sulfate to produce elemental copper and ferrous ion in solution; and

introducing oxygen and sulfuric acid to the ferrous ion-bearing solution to oxidize the ferrous to ferric ions.

4,115,222
METHOD FOR ELECTROLYTIC WINNING OF LEAD

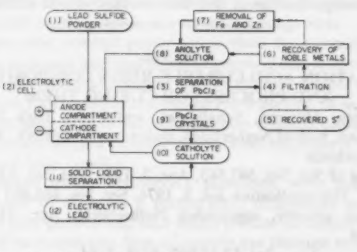
Hiroshi Kametani, Tokyo, and Aiko Aoki, Chofu, both of Japan, assignors to National Research Institute For Metals, Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,282

Claims priority, application Japan, Oct. 25, 1976, 51-127162

Int. Cl.² C25C *1/18*

U.S. Cl. 204—117 **11 Claims**



1. A method for winning lead from a powdery material consisting of a lead sulfide concentrate or a powdery material containing lead sulfide by passing an electric current across the anode and the cathode of an electrolytic cell partitioned into an anode compartment and a cathode compartment by a diaphragm; which comprises filling the anode compartment with a suspension of the aforesaid powdery material in an aqueous solution of a water-soluble chloride, electrolytically forming the crystalline particles of lead chloride by the anodic oxidation of the suspended particles, separating and refining the crystalline particles of lead chloride from the aqueous solution of the water-soluble chloride, and filling the cathode compartment with a solution of the separated and refined crystalline particles of lead chloride dissolved in an aqueous solution of a water-soluble chloride thereby to deposit lead electrolytically on the cathode.

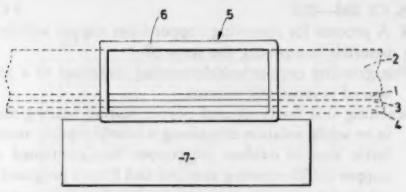
4,115,223
GALLIUM ARSENIDE PHOTOCATHODES

Edward John Thrush, Stansted Mountfitchet, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 641,123, Dec. 15, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,580

Int. Cl.[2] C25F *3/02, 3/14;* **H01L** *27/12, 21/36*

U.S. Cl. 204—129.6 **16 Claims**



1. A method of making a transmission type active layer, III-V semiconductor photocathode including the steps of:

providing a semiconductive body containing a layer which is to form the active layer of the photocathode;

preparing a billet of glass having a coefficient of expansion matched with said semiconductive body;

placing a surface of the billet in contact with a surface of the semiconductive body to form an assembly of said billet and body;

applying pressure between the body and the billet;

heating the billet and body assembly by a susceptor arrangement of an induction heater to preferentially heat the semiconductive body to a temperature above the softening point of the glass while leaving the bulk of the billet at a temperature beneath said softening point;

reducing the temperature of the assembly once the surface of the billet in contact with the semiconductive body has begun to flow;

annealing the assembly at a reduced temperature;

depositing an anti-reflection coating on an optical input face of said billet opposite said body; and

removing a porton of said body to expose said active layer.

4,115,224
RADIATION ACID CURABLE RESIN COMPOSITIONS AND PROCESS FOR CURING THEM

Reginoldus Havinga, Schalkhaar, and Pieter Dirk Swaters, Lochem, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Division of Ser. No. 347,563, Apr. 3, 1973, Pat. No. 3,850,989. This application Jul. 5, 1974, Ser. No. 486,097

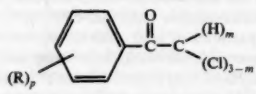
Claims priority, application Netherlands, Apr. 21, 1972, 7205384

Int. Cl.[2] C08F *8/18, 8/34*

U.S. Cl. 204—159.18 **7 Claims**

1. In a process for curing an acid-curable resin containing a phenol, urea or melamine resin by irradiation with ultraviolet light, the improvement comprising

incorporating therein a photocatalyst having the formula



wherein $m = 0$, 1 or 2 and p is an integer from 1 to 5 and wherein, when p is 1, R represents an alkyl or alkoxy group having at least 4 C-atoms, and when $p > 1$, R represents alkyl or alkoxy groups having together at least 4 C-atoms.

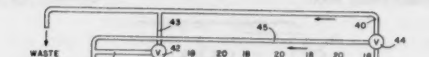
4,115,225
ELECTRODIALYSIS CELL ELECTRODE REVERSAL AND ANOLYTE RECIRCULATION SYSTEM

Edgardo J. Parsi, Lexington, Mass., assignor to Ionics, Inc., Watertown, Mass.

Filed Jul. 22, 1977, Ser. No. 818,041

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 P **7 Claims**



1. In an electrodialysis cell having an anode, an anode chamber, a cathode, a cathode chamber and at least one fluid treatment chamber, positioned between said anode and cathode chambers, said chambers separated by permselective membranes, the improvement which comprises:

a. a direct current source connected to said anode and cathode;

b. an anolyte storage tank;

c. first anolyte pipe means connecting the output of said anolyte tank to the input of said anode chamber;

d. second anolyte pipe means connecting the output of said anolyte tank to the input of said cathode chamber;

e. third anolyte pipe means connecting the output of said anode chamber to the input of said anolyte tank;

f. fourth anolyte pipe means connecting the output of said cathode chamber to the input of said anolyte tank;

g. first waste pipe means connected to the output of said anode chamber;

h. second waste pipe means connected to the output of said cathode chamber;

i. pump means for simultaneously circulating anolyte through said anode and cathode chambers;

j. first switching valve means for alternatively directing the output of said anode chamber through said third anolyte pipe and said first waste pipe;

k. second switching valve means for alternatively directing the output of said cathode chamber through said fourth anolyte pipe and said second waste pipe; and

l. reversing switch means for reversing the polarity of said direct current source, for activating said first valve switching means for directing the output of said anode chamber through said first waste pipe, and for activating said second switching valve means for directing the output of said cathode chamber through said fourth anolyte pipe.

4,115,226
CATAPHORETIC ELECTRODEPOSITION BATHS CONTAINING WATER-SOLUBLE LEAD SALTS

Robert R. Zwack, New Kensington, and Robert D. Jerabek, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 6, 1977, Ser. No. 785,154

Int. Cl.[2] C25D *13/06, 13/10*

U.S. Cl. 204—181 C **6 Claims**

1. An improved method of electrocoating an electrically conductive article serving as a cathode in an electrical circuit comprising an anode, said cathode and an electrodeposition bath comprising an aqueous dispersion of a cationic electrodepositable resin, the improvement comprising the addition to

said electrodeposition bath of 50 to 3000 parts per million based on total bath weight of a water-soluble lead compound in an amount sufficient such that it will improve the corrosion resistance of a ferrous metal article which is cathodically electrocoated in said electrodeposition bath, the lead compound being soluble to the extent of at least one percent by weight in water having a pH of 7.

4,115,227

CATHODIC ELECTRODEPOSITION OF PAINTS

Isidor Hazan, Clementon, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 746,298, Dec. 1, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 845,891

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 C **19 Claims**

1. In a process for electrocoating with a coating composition a negatively-charged substrate immersed in a coating bath containing an aqueous dispersion of said coating composition, said bath having a cathode zone containing said substrate and an anode zone containing a charged anode, said substrate and said anode constituting oppositely-charged electrodes, the charged electrodes being maintained in electrical contact with each other by means of said bath, wherein said bath comprises a cationic film-forming polymer, an acidic ionizing agent, and a crosslinking agent, the improvement which comprises:

employing phosphoric acid as an acidic ionizing agent;

employing as a cationic film-forming polymer a graft copolymer having a backbone portion containing secondary and/or tertiary amine functionality, said graft copolymer being stabilized in the aqueous dispersion by a phosphate salt of the amine functionality, said backbone portion being graft polymerized with hydrophobic copolymer derived from epoxy esters, said hydrophobic copolymer having a high enough concentration in the graft copolymer that the coating deposited on the substrate has at least about 83% solids content and so that the phosphoric acid concentration in the deposited coating composition is no more than about 17.5% of the phosphoric acid concentration in the bath; and

employing as the crosslinking agent a composition which is nonreactive in the bath but reactive with said film-forming polymer at elevated temperatures.

4,115,228

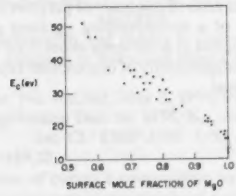
METHOD OF MAKING SECONDARY-ELECTRON EMITTERS

Victor E. Henrich, Newton, and John C. C. Fan, Chestnut Hill, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 604,390, Aug. 13, 1975, Pat. No. 4,038,216, which is a continuation-in-part of Ser. No. 482,109, Jun. 24, 1974, abandoned. This application May 31, 1977, Ser. No. 802,203

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 EC **2 Claims**



1. A method of making a secondary-electron emitter comprising:

combining a secondary-electron emitter material and a metallic material to provide a fine-grained cermet layer of said materials,

removing said electrically conductive material from the surface of said layer to change the ratio of said materials on said surface,

wherein said steps of combining said emitter material and said conductive material comprises sputtering said materials to transfer them to form a film on a substrate, and

said step of removing said electrically conductive material comprises sputter etching said film to remove both the emitter and conductive material but at different rates to leave a surface layer richer in said emitter material than existed prior to sputter etching.

4,115,229

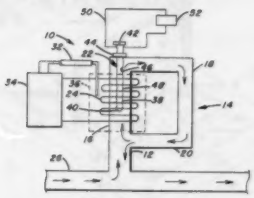
APPARATUS FOR SAMPLING A GASEOUS STREAM

David M. Capone, Oakmont, Pa., assignor to Thermo-Lab Instruments, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,724

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **5 Claims**



1. Apparatus for sampling a gaseous stream flowing in a main passageway comprising,

a main passageway with a gaseous stream flowing therethrough,

a closed loop conduit having an inlet portion, an intermediate portion and an outlet portion,

a junction conduit in fluid communication with said main passageway and said closed loop conduit arranged to convey a sample of said gaseous stream from said main passageway to said closed loop conduit inlet portion and a portion of the analyzed sample from said closed loop conduit outlet portion to said main passageway,

said junction conduit positioned in fluid flow communication with said inlet and outlet portions of said loop conduit and providing a common ingress for said sample to said closed loop conduit and egress for a portion of said analyzed sample from said closed loop conduit causing the recirculation of a portion of said analyzed sample in said closed loop conduit,

convection means operatively associated with said loop conduit to maintain a temperature differential between said inlet portion and said outlet portion to induce a convective continuous flow of sample gas through said junction conduit and said closed loop conduit, and

sensing means in the flow path through said loop conduit for sensing the condition of sample gas.

4,115,230

PARTIAL OXYGEN MEASUREMENT SYSTEM

Paul Beckman, 944 Henrietta Ave., Huntingdon Valley, Pa. 10096

Filed Jan. 6, 1977, Ser. No. 757,207

Int. Cl.[2] G01N *27/28, 27/46;* **H05B** *3/58*

U.S. Cl. 204—195 R **55 Claims**

1. A fluid measuring system for quantitating the amount of particular constituents contained in a fluid, comprising:

(a) sensor means having a chamber adapted to contain said fluid, said sensor means having anode electrode means extending internal said chamber within said sensor means,

and, cathode electrode means extending internal said chamber and said anode electrode means;

(b) housing means for insert of said sensor means in predetermined positional relationship therewith;

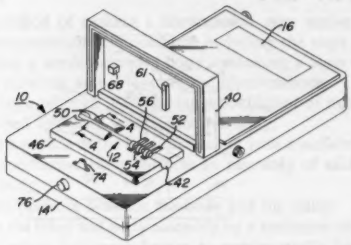
(c) thermostatic control means within said housing means for heating and maintaining said fluid within said chamber at a predetermined temperature; and,

(d) means for applying current to said sensor means and said thermostatic control means for measurement of the amount of said particular constituents contained in said fluid.

32. A fluid measuring sensor comprising:

(a) an enclosed glass tubular housing extending in a longitudinal direction forming an internal chamber adapted to contain a fluid; said housing including a resilient bulb element mounted to one end of said housing for drawing fluid internal said chamber;

(b) anode electrode means extending internal said housing in said longitudinal direction; and,



(c) cathode electrode means extending in said longitudinal direction internal said housing and said anode electrode means.

52. A fluid measuring thermostatic control assembly adapted to heat and maintain a fluid contained within a fluid measuring sensor to a predetermined temperature, comprising:

(a) heater mounting means adapted to receive said fluid measuring sensor; said heater mounting means including a flexible foil member having an inverted Omega contour deformable into contiguous relation with a predetermined segmental surface area of a stem portion of said fluid measuring sensor, said flexible foil member having heater elements contained therein passing in an undulating manner when taken with respect to a longitudinal extension of said foil member and

(b) electrical circuit means coupled to said heater mounting means for heating and maintaining said predetermined temperature of said fluid within said sensor.

4,115,231

CROSSLINKABLE MIXTURES OF OLIGOMERS OR POLYMERS AND DIAMINES

Roland Darms, Therwil; Vratislav Kvita, Muttenz, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

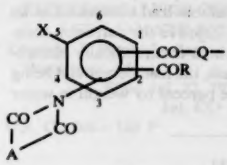
Filed Dec. 6, 1976, Ser. No. 748,016

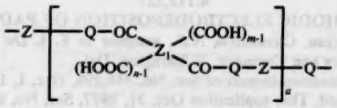
Claims priority, application Switzerland, Dec. 19, 1975, 16512/75

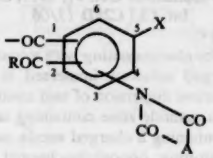
Int. Cl.[2] **C08G** *73/12*

U.S. Cl. 204—159.22 **11 Claims**

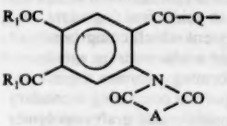
1. A crosslinkable mixture, essentially unpolymerized and stable at temperatures up to about 100° C., consisting of at least one oligomer or polymer of the formula Ia or Ib

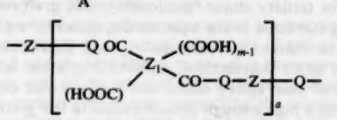


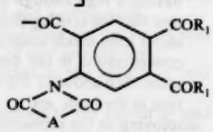




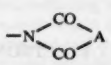
or







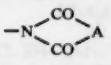
where in formula Ia the



groups independently of each other are linked to the benzene rings in the 3- or 4- position; and a carbonyl of the —COQZ$_a$QOC— moiety and a —COR group are attached in pairs to adjacent carbon atoms at the 1- and 2- positions of the benzene rings, whereby on each benzene ring one of said carbonyl and —COR groups can be in the 1-position and the other in the 2- position; or of a corresponding cyclised derivative, and of at least one diamine of the formula II

$$HQ - Z_2 - QH \qquad (II)$$

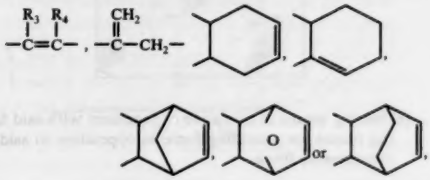
whereby the molar ratio of oligomer or polymer of the formula Ia and/or Ib, or of a corresponding cyclised derivative, to diamine of the formula II is between about 1.2:1 and 50:1, and wherein the X's independently of one another represent hydrogen or, if the radical



is in the 4-position of the benzene ring, also —COR$_2$, the R's and R$_2$'s independently of one another represent a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one

alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy of 1 to 18 carbon atoms or an O^-M^+ group,

the R_1's independently of one another represent a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy of 1 to 18 carbon atoms or an O^-M^+ group, or two adjacent R_1's together represent the —O— grouping, the A s independently of one another represent a radical of the formula



R_3 and R_4 independently of one another represent hydrogen, chlorine, bromine or methyl,

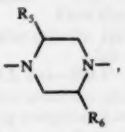
M^+ represents an alkali metal cation, a trialkylammonium cation having 3–24 carbon atoms, or a quaternary ammonium cation,

a represents a number from 1–100,

m and *n* independently of one another represent the number 1 or 2,

the Z's and Z_2's independently of one another represent an aliphatic radical having at least 2 carbon atoms, a cycloaliphatic, carbocylic-aromatic or heterocyclic-aromatic radical,

the Q's represent —NH—, or —Q—Z—Q— or —Q—Z_2—Q— represent the grouping



the Z_1's represent an aliphatic radical having at least two carbon atoms, or a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carbon-amide groups and carboxyl groups are bound to different carbon atoms, and the carboxyl groups, if Z_1 represents a cyclic radical and at least one of *m* and *n* represetns the number 2, are each in the ortho-position with respect to a carbonamide group, and

R_5 and R_6 independently of one another represent hydrogen, methyl or phenyl.

4,115,232

CURING PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING N-SUBSTITUTED ACRYLOYLOXYETHYL AMINES

Kayson Nyi, Sellersville, and Sandra I. Graham, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

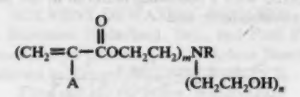
Division of Ser. No. 466,353, May 2, 1974, Pat. No. 4,001,304. This application Dec. 10, 1975, Ser. No. 639,332

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **17 Claims**

1. In a process of curing a composition by actinic radiation energy the improvement of applying such energy to a radiation curable composition comprising

(1) from about 5% to about 80% by weight of a cure accelerator compound of the formula



wherein A is hydrogen or methyl; R is alkyl, cycloalkyl or a radical of the formula $—CH_2CH_2X$ wherein X is cyano, carbamoyl or a radical of the formula $—CO_2R^1$, COR^1, $CONHR^1$ or $CONR^1_2$ wherein R^1 is alkyl; *m* is a number having a value in the range of 1 to 2 and *n* is a number having a value in the range of 0 to 1, and

(2) from about 20% to about 95% by weight of a photopolymerizable polyfunctional ethylenically unsaturated compound, thereby curing the composition.

4,115,233

TREATMENT OF AQUEOUS DISPERSIONS

Edward J. Griffith, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 755,117

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 R **11 Claims**

1. A process for removing water from an aqueous dispersion of solids which have a negative electrical charge in relation to ground zero via electroendosmosis comprising:

mounting a first cathode means in said aqueous dispersions,

mounting an anode means in said aqueous dispersion separated from said first cathode means,

mounting a second cathode means in said aqueous dispersion intermediate said first cathode means and said anode means and closer to said first cathode means than said anode means,

establishing a direct current electrical potential between said first and second cathode means and said anode means wherein the water in said aqueous dispersion of solids is moved toward said first and second cathode means whereby said water may be removed and said solids remain.

4,115,234

ELECTROPHORETIC TRANSFER PROCESS

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Apr. 1, 1976, Ser. No. 672,678

Claims priority, application Netherlands, Apr. 17, 1975, 7504599

Int. Cl.[2] C25D *1/12*

U.S. Cl. 204—180 R **10 Claims**

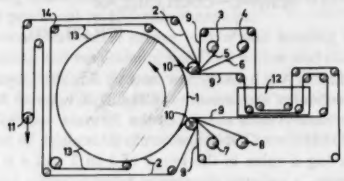
1. An electrophoretic transfer process, comprising the steps of:

impregnating a receiving material with a thickening agent having a molecular weight exceeding 1×10^6;

drying the receiving material;

contacting a carrier material containing the substance to be

transferred with a receiving material in the presence of a moist environment; and



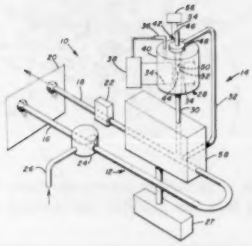
applying an electric field across said carrier material and said receiving material.

4,115,235

APPARATUS FOR CONVEYING A GAS SAMPLE THROUGH AN ANALYZER CHAMBER

David M. Capone, Oakmont, Pa., assignor to Thermo-Lab Instruments, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,712
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **17 Claims**



1. Apparatus for sampling a gaseous fluid comprising,
a first loop type conduit having an inlet leg and an outlet leg disposed in spaced, lateral relation to each other,
an eductor device positioned at a location along the length of said loop conduit,
a second loop type conduit having an inlet leg and an outlet leg joined to said first loop conduit at a location upstream of said eductor device,
said second loop conduit inlet and outlet legs joined to said first loop conduit at substantially the same location along the length thereof, and
an electrochemical cell sensing element in the flow path through said second loop conduit.

4,115,236

CELL CONNECTOR FOR BIPOLAR ELECTROLYZER

B. Bernard Smura, Marcellus, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 1, 1977, Ser. No. 856,382
Int. Cl.[2] C25B *1/24, 9/02*
U.S. Cl. 204—254 **10 Claims**

1. A cell connector adapted for insuring direct electrical communication and mechanical connection with a cell in a bipolar permselective membrane electrolyzer while precluding fluid and gaseous flow therefrom, comprising:
(a) an electrically non-conductive cell web;
(b) an electrically conductive insert having a bore therein disposed in an aperture in said web;
(c) an electrode boss bearing a cell electrode on a first face thereof and disposed adjacent said insert at a second face thereof defining an electrode interface, said boss including engaging means proximate said bore;
(d) electrically conductive fastening means disposed through said bore and received in mating cooperation with said engaging means, said fastening means provided an axial compressive force at said interface; and

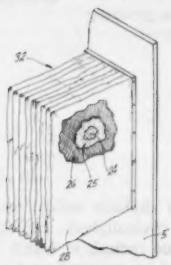
(e) biasing means in operative engagement with said fastening means for providing force in opposition to said axial compressive force.

4,115,237

ELECTROLYTIC CELL HAVING MEMBRANE ENCLOSED ANODES

Kenneth E. Woodard, Jr., and Steven J. Specht, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 3, 1977, Ser. No. 756,313
Int. Cl.[2] C25B *1/16, 1/26, 11/03, 13/02*
U.S. Cl. 204—258 **12 Claims**

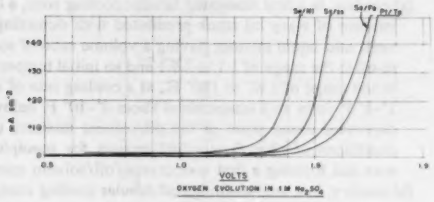


1. A membrane cell for the electrolysis of alkali metal chloride brines which comprises:
(a) an anode section having a plurality of self-contained anode compartments positioned in parallel and spaced apart from each other, said anode compartments comprising a foraminous metal anode, said anode having an electrocatalytically coated portion, an ion permeable membrane enclosing said anode, and spacing means interposed between said electrocatalytically coated portion of said anode and said ion permeable membrane;
(b) a cathode section comprising a plurality of foraminous metal cathodes, said cathodes being interleaved between adjacent anodes, said cathodes being spaced apart from said ion permeable membranes;
(c) means for introducing said alkali metal chloride brines into said anode compartments and means for removing chlorine gas and spent alkali metal chloride brines from said anode compartments;
(d) a cell body for housing said anode section and said cathode section, and
(e) means for removing hydrogen gas and alkali metal hydroxide solutions from said cell body.

4,115,238
SELENIUM- AND TELLURIUM-COATED METAL ELECTRODES

Divna Cipris, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1977, Ser. No. 786,703
Int. Cl.[2] C25B *11/04*
U.S. Cl. 204—290 R 1 Claims



1. An electrode for use in electrochemical processes comprising a metallic base comprising a metal selected from the group consisting of iron, cobalt, nickel, manganese, chromium and alloys thereof with each other, having deposited thereon and in direct contact therewith a surface coating of selenium, tellurium or mixtures thereof, each in oxidized form.

4,115,239
COATED ANODE

Pierre Bouy, Enghien-les-Bains, and Dominique Ravier, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 20, 1977, Ser. No. 843,858
Claims priority, application France, Nov. 4, 1976, 76 33217
Int. Cl.[2] C25B *11/10, 1/34*
U.S. Cl. 204—290 F 7 Claims

1. An anode for an electrolytic cell having a coating, which coating comprises a composition of cobalt oxide and an alkali-metal titanium bronze.

4,115,240
METHOD OF REGENERATING ELECTROCHEMICAL PROPERTIES OF CATION EXCHANGE MEMBRANE OF FLUORINATED POLYMER

Tatsuro Asawa, and Tomoki Gunjima, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

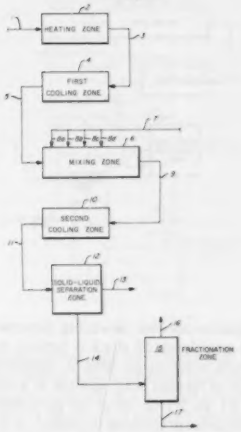
Filed Nov. 2, 1977, Ser. No. 847,909
Int. Cl.[2] C25B *13/08*
U.S. Cl. 204—296 12 Claims

1. In a method of regenerating the electrochemical properties of cation exchange membrane of a carboxylic acid type fluorinated polymer having ion exchange groups of $-(COO)_mM$ wherein M represents an alkali metal or an alkaline earth metal; and *m* represents a valence of M, an improvement which comprises converting the ion exchange groups of $-(COO)_mM$ to the corresponding acid or ester groups of —COOR wherein R represents hydorgen or a C_1–C_5 alkyl group and heat-treating the fluorinated polymer having said —COOR groups at a temperature greater than that at which said fluorinated polymer has a volumetric melt flow rate of 0.1 mm^3/sec and below the thermal decomposition temperature of said fluorinated polymer.

4,115,241
SOLVENT DEWAXING PROCESS

Charles W. Harrison, Nederland, Tex., and Paul P. Bozeman, Jr., deceased, late of Groves, Tex. (by Arlene Bozeman, executrix), assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,140
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 5 Claims



1. In a continuous process for separating wax from a waxy distillate oil stock having an initial boiling point in the range of 600° to 625° F. and an end point in the range of about 1050° to 1100° F., wherein said waxy oil stock is treated with dewaxing solvent in a solvent to oil volume ratio of from about 1:1 to about 5:1, wherein said oil-solvent mixture is cooled to a selected separation temperature for crystallizing wax from said mixture, wherein solid wax is separated, in a solid-liquid separation zone, from the solvent-oil mixture, and wherein said separated solvent-oil mixture is fractionated, in a fractionation zone, into a solvent fraction and a dewaxed oil fraction; the improvement which comprises:

(a) heating, in a heating zone, said waxy oil stock, undiluted by dewaxing solvents, to a temperature at which all wax is in solution;

(b) cooling, in a first cooling zone, said heated waxy oil by indirect heat exchange with refrigerant fluids under conditions of plug flow radial mixing to a temperature about 0°–15° F. below the waxy oil cloud point temperature;

(c) mixing, in a mixing zone, said cooled waxy oil from step (b) with dewaxing solvent, having a temperature about 25°–40° F. above said separation temperature, in a volume ratio of solvent to oil from about 1:1 to about 5:1, under conditions of plug flow radial mixing, for precipitating wax and forming a wax/oil/solvent mixture;

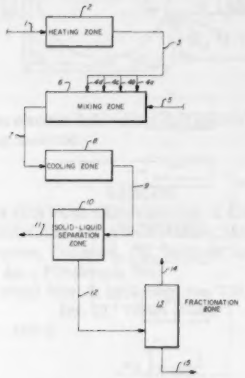
(d) cooling, in a second cooling zone said wax/oil/solvent mixture from step (c) at a rate of about 1°–8° F. per minute, to said separation temperature for crystallizing wax from said solvent-oil mixture; and

(e) flowing the wax/solvent/oil mixture from step (d) to said solid-liquid separation zone at said separation temperature.

4,115,242
SOLVENT DEWAXING PROCESS

Avilino Sequeira, Port Arthur; Herbert J. Pitman, Nederland; Charles W. Harrison, Nederland, and Jerry E. Quasny, Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,142
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 **10 Claims**



1. In a continuous solvent dewaxing process wherein a light waxy distillate petroleum oil stock is heated, in a heating zone, to a temperature wherein all wax is dissolved, wherein said heated oil stock is treated with solvent in a solvent to oil volume ratio of 1:1 to 5:1 to form an oil-solvent mixture, and wherein said oil-solvent mixture is cooled, in a cooling zone, at a cooling rate of 1°–8° F./min, to a selected separation temperature in the range of about +25° to −40° F. for precipitating wax from said oil-solvent mixture; where said precipitated wax is separated, in a solid-liquid separation zone, from said oil-solvent mixture to yield slack wax and a free oil-solvent mixture is fractionated, in a fractionation zone, to yield a solvent fraction and a dewaxed oil fraction; the improvement which comprises:

(a) continuously flowing a liquid stream of dewaxing solvent, having a selected temperature in the range of about 40°–80° F., into the inlet of a plug flow radial mixing zone;

(b) injecting said heated waxy oil stock into said dewaxing solvent flowing within said plug flow radial mixing zone via a plurality of injection nozzles spaced along the length of said mixing zone;

(c) mixing, in said plug flow radial mixing zone each injected portion of heated waxy oil stock intimately with said flowing solvent before injection of the next following portion of heated waxy oil stock, for producing an oil-solvent mixture exiting said mixing zone having a temperature below the depressed cloud point;

(d) cooling, in a cooling zone, said oil-solvent mixture to a selected separation temperature in the range of about +25° F. to −40° F., for precipitating wax and forming a wax/oil/solvent mixture; and

(e) flowing said wax/oil/solvent mixture from said cooling zone to said solid-liquid separation zone.

4,115,243
SOLVENT DEWAXING PROCESS

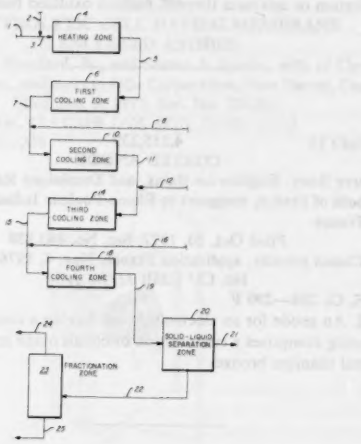
Charles W. Harrison; Herbert J. Pitman, both of Nederland, and Avilino Sequeira, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,143
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 **9 Claims**

1. In a continuous solvent dewaxing process wherein a heavy waxy petroleum oil charge selected from distillate or residual oil stocks, is diluted with solvent to form an oil-solvent mixture having all wax dissolved therein, wherein the oil-solvent mixture is cooled to a selected separation temperature for precipitating wax crystals and forming a wax/oil/solvent mixture, wherein wax is separated from such wax/oil/solvent mixture in a solid-liquid separation zone, forming a solid wax cake and a wax free oil-solvent mixture, and wherein the wax free oil-solvent mixture is fractionated, in a fractionation zone to yield a solvent stream and a dewaxed oil product stream; the improvement which comprises:

(a) cooling, in a first elongated tubular cooling zone, a liquid mixture of waxy oil stock prediluted with dewaxing solvent, said liquid mixture having a volume ratio of solvent to oil in the range of 1:1 to 2.5:1 and an initial temperature in the range of 130° to 180° F., at a cooling rate of about 1°–8° F./min. to a temperature about 0°–10° F. below the depressed cloud point of the oil/solvent mixture, under conditions of plug flow radial mixing, for precipitating wax and forming a first wax crystal/oil/solvent mixture;

(b) cooling, in a second elongated tubular cooling zone, said first wax/oil/solvent mixture and a first portion of dilution solvent equivalent to about 0.3 to 0.7 volumes of waxy oil



charge, at a cooling rate of 1°–8° F./min, to a temperature in the range of about 50°–100° F. for precipitating additional wax and forming a second wax crystal/oil/solvent mixture;

(c) cooling, in a third elongated tubular cooling zone, said second wax/oil/solvent mixture and a second portion of dilution solvent equivalent to about 0.3 to 0.7 volumes of waxy oil charge, at a cooling rate of 1°–8° F./min, to a temperature in the range of about 10°–75° F. for precipitating additional wax and forming a third wax crystal/oil/solvent mixture;

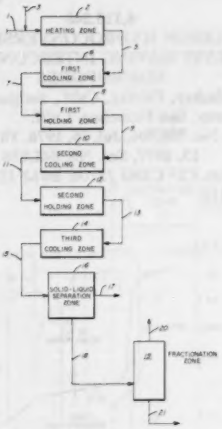
(d) cooling, in a fourth elongated tubular cooling zone, said third wax/oil/solvent mixture and a third portion of dilution solvent equivalent to about 0.3 to 1.5 volumes of waxy oil charge, at a cooling rate of about 1°–8° F./min, under conditions of plug flow radial mixing to a selected separation temperature in the range of about +15° F. to about −15° F. for precipitating additional wax and forming a fourth wax crystal/oil/solvent mixture;

(e) flowing said fourth wax crystal/oil/solvent mixture from said fourth cooling zone to said solid-liquid separation zone.

4,115,244
SOLVENT DEWAXING PROCESS

Herbert J. Pitman; Charles W. Harrison, both of Nederland, and Avilino Sequeira, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,144
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 7 Claims



1. In a solvent dewaxing process for separating solid-wax from a waxy petroleum distillate oil stock, wherein said waxy oil stock, heated to a first temperature sufficient to dissolve all wax therein, is treated with dewaxing solvent in a volume ratio of solvent to oil stock in the range of 1:1 to 5:1 respectively, wherein said mixture of oil and solvent is cooled at a rate of about 1°–8° F /min. to a selected separation temperature in the range of +15° F. to −40° F. for forming a mixture of wax crystals in oil-solvent solution, wherein said wax/oil/solvent mixture is separated, in a solid-liquid separation zone, into a wax-free oil-solvent solution and slack wax, and wherein said wax-free oil-solvent solution is fractionated, in a fractionation zone, to yield a solvent fraction and a dewaxed oil fraction; the improvement which comprises:

a. cooling, in a first cooling zone, a mixture comprising waxy oil stock and dewaxing solvent in a solvent to oil volume ratio of about 1:1 to 5:1, at a cooling rate of about 1°–8° F.min. to a second temperature about 40°–50° F. above a selected separation temperature for crystallizing wax from said waxy oil-solvent mixture and forming a wax/oil/solvent mixture;

b. mixing, in a first holding zone, said wax/oil/solvent mixture from said first cooling zone, at about said second temperature, under conditions of plug flow radial mixing, with substantially no heat exchange, for a period of about 30 seconds to about 2 minutes;

c. cooling, in a second cooling zone, said wax/oil/solvent mixture from said first holding zone at a rate of about 1°–8° F.min. under conditions of plug flow radial mixing, to a third temperature about 15°–20° F. above said selected separation temperature for crystallizing additional wax;

d. mixing, in a second holding zone, said wax/oil/solvent mixture, from said second cooling zone, at about said third temperature, under conditions of plug flow radial mixing, with substantially no heat exchange, for a period of about 30 seconds to about 2 minutes;

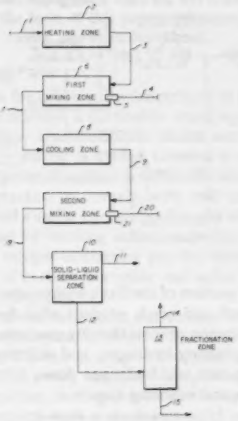
e. cooling, in a third cooling zone, the wax/oil/solvent mixture from said second holding zone, at a rate of about 1°–8° F.min. to said selected separation temperature for crystallization of additional wax; and

f. flowing said wax/oil/solvent mixture from said third cooling zone to said solid-liquid separation zone.

4,115,245
SOLVENT DEWAXING PROCESS

Charles W. Harrison, and Leonard R. Watts, both of Nederland, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,145
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 4 Claims



1. In a continuous process for separating wax from an intermediate waxy distillate oil stock wherein said waxy oil stock is treated with dewaxing solvent, in a solvent to oil ratio of about 1:1 to about 5:1, and is cooled to a selected separation temperature for crystallizing wax from said waxy oil, and forming a wax/oil/solvent mixture, wherein said wax/oil/solvent mixture is separated, in a solid-liquid separation zone into solid wax and a wax free oil solvent mixture, and wherein said wax free oil-solvent mixture is fractionated, in a fractionation zone, for producing a solvent fraction and a dewaxed oil fraction; the improvement which comprises:

(a) heating, in a heating zone, said waxy oil charge to a temperature sufficient to melt all wax therein;

(b) mixing, in a first mixing zone, said heated waxy oil with a first stream of dewaxing solvent having a temperature of 60°–80° F, in a solvent to oil ratio of from about 1:1 to about 4:1 under conditions of plug flow radial mixing sufficient to provide a homogeneous mixture of oil and solvent at a temperature below the depressed cloud point;

(c) cooling, in a cooling zone, said solvent-oil mixture at a rate of 1°–8° F per minute to said selected separation temperature, for crystallizing wax and forming a first wax/oil/solvent mixture;

(d) mixing, in a second mixing zone, said first wax/oil/solvent mixture with a second stream of solvent in an amount equivalent to about 1–2 volumes of waxy oil charge, at about the selected separation temperature, for crystallizing additional wax and forming a second wax/oil/solvent mixture; and

(e) flowing said second wax/oil/solvent mixture, at said selected separation temperature to said solid-liquid separation zone.

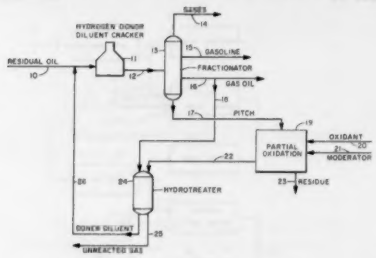
4,115,246
OIL CONVERSION PROCESS

Glenn A. Sweany, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 31, 1977, Ser. No. 764,123
Int. Cl.[2] C10G *13/00*
U.S. Cl. 208—56 8 Claims

1. In a hydrogen donor diluent cracking process wherein heavy liquid hydrocarbon oil is charged to a thermal cracker and thermally cracked in the presence of a hydrogenated

donor solvent, the thermally cracked material is fractionated to produce fractions comprising light ends, intermediate distillates, gas oil material and a pitch product boiling above 500° C., and wherein at least a part of the product gas oil material is hydrogenated and recycled to the thermal cracking step as hydrogen donor solvent, the improvement comprising:



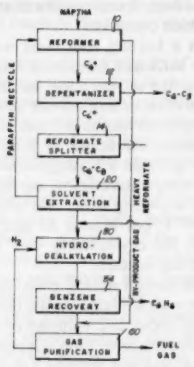
subjecting a portion of the fresh hydrocarbon oil feed to the process and said pitch product after fractionation to a partial oxidation process thereby producing a product gas stream containing hydrogen, and utilizing said hydrogen to hydrogenate said hydrogen donor solvent for recycle to said thermal cracking step.

4,115,247

BENZENE PRODUCTION BY SOLVENT EXTRACTION AND HYDRODEALKYLATION

Leon M. Lehman, Miami Beach, and Glen I. Lambert, Miami, both of Fla., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Jul. 16, 1976, Ser. No. 706,026
Int. Cl.[2] C10G *35/18;* C07C *3/58*
U.S. Cl. 208—62 **11 Claims**



1. A process for converting a naphtha feedstock to a pure benzene comprising:

(a) reforming the naphtha;

(b) removing a major fraction of C_4 - C_5 and heavy reformate components to obtain a reformate containing a major portion of C_6 - C_8 aromatic hydrocarbons and a minor paraffinic portion;

(c) extracting the aromatic hydrocarbons from the reformate countercurrently with a selective hydrophilic solvent having high solubility aromatic hydrocarbons and low solubility for paraffinic hydrocarbons to obtain an extract stream rich in C_6 - C_8 aromatic hydrocarbons and a raffinate stream rich in paraffinic hydrocarbons;

(d) recovering the selective solvent from the extract stream to obtain an aromatic component comprising about 80 to 96 wt. % C_6 - C_8 aromatic hydrocarbons and about 3 to 18 wt. % paraffinic hydrocarbons;

(e) hydrodealkylating the aromatic component; and

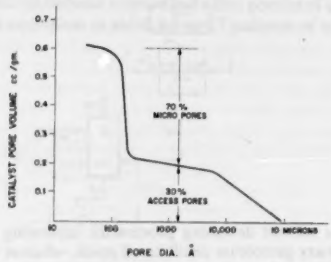
(f) recovering substantially pure benzene.

4,115,248

HYDROCARBON HYDROCONVERSION WITH A CATALYST HAVING INTERCONNECTED MACROPORES

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 708,804, Jul. 26, 1976. This application Oct. 13, 1977, Ser. No. 841,856
Int. Cl.[2] C10G *13/06;* B01J *35/10*
U.S. Cl. 208—112 **10 Claims**

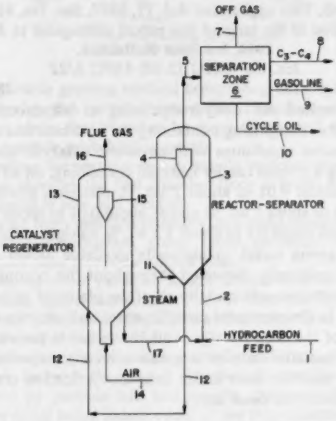


1. A process for treating a hydrocarbon feedstock containing at least an appreciable amount of a high-molecular-weight hydrocarbon component, which comprises (I) contacting in a reaction zone a mixture containing said feedstock and hydrogen gas with a hydrotreating catalyst, said contacting including (1) a temperature in the range from about 200° to 540° C, (2) a total pressure in the range from about 1 to 300 atmospheres, (3) a hydrogen partial pressure in the range from about 0 to 200 atmospheres, (4) a hydrogen rate in the range from about 0 to 9000 standard cubic liters of hydrogen per liter of feedstock, and (5) a liquid hourly space velocity in the range from about 0.1 to 25, said catalyst comprising a rigidly interconnected pack of irregularly shaped particles of which (1) less than 5 weight percent thereof have average diameters in the range 0.15 to 1.3 mm, (2) at least 10 weight percent thereof have average diameters in the range above 0.1 micron and (3) the remainder thereof have average diameters in the range below 0.15 mm, said pack having a pore volume of at least 0.065 cc per cc of the pack and having access channels among said particles throughout the pack, said channels comprising interconnected macropores having diameters as measured by mercury porosimetry in the range 0.1 to 15 microns, and said macropores contributing a fraction of said pore volume, which is in the range from about 3 to 45 percent of said pore volume; said particles comprising pulverable materials selected from the group consisting of at least one refractory oxide component and at least one hydrogenating component, said refractory oxide component being further selected from the group consisting of the oxides of the metals of Groups II, III and IV, said hydrogenating component being further selected from the group consisting of the metals, oxides and sulfides of the metallic elements of Groups VIB and VIII; and said composition containing, in parts by weight, for each 100 parts of said refractory oxide component an amount of said hydrogenating component, calculated as metal, in the range from about 0.1 to 50 parts; and (II) withdrawing the resulting treated product from said reaction zone.

4,115,249
PROCESS FOR REMOVING SULFUR FROM A GAS

William A. Blanton, Jr., and Robert L. Flanders, both of San Anselmo, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 666,115, Mar. 11, 1976, Pat. No. 4,071,436. This application Dec. 17, 1976, Ser. No. 751,640
Int. Cl.[2] C10G *11/02;* B01J *21/28;* C01B *17/00*
U.S. Cl. 208—120 6 Claims



1. In a process for cracking a hydrocarbon in the absence of added hydrogen including the steps of (a) cycling a particulate cracking catalyst between a cracking zone and a catalyst regeneration zone in a catalytic cracking system; (b) contacting a sulfur-containing hydrocarbon feed with said catalyst in said cracking zone at cracking conditions, forming sulfur-containing coke on said catalyst, and recovering from said cracking zone fluid products including a liquid hydrocarbon fraction; and (c) forming a sulfur oxides-containing flue gas by burning coke off said catalyst in said regeneration zone; the method for decreasing the amount of sulfur in said flue gas which comprises the steps of:

(a) heating particles of a cracking catalyst consisting essentially of an amorphous silica-alumina matrix and a crystalline aluminosilicate zeolite to a temperature between 800° and 1500° F;

(b) impregnating the resulting catalyst particles with an amount of an aluminum compound sufficient to add from 0.1 to 25 weight percent aluminum, calculated on an elemental metal basis, to said catalyst particles;

(c) cycling the resulting impregnated catalyst particles between said cracking zone and said regeneration zone in said catalytic cracking system;

(d) reacting sulfur oxides in said flue gas with the added aluminum in said catalyst particles to form a sulfur-containing solid in said catalyst particles in said regeneration zone; and

(e) forming hydrogen sulfide in said cracking zone by contacting said hydrocarbon feed with said sulfur-containing solid in said catalyst particles and removing the resulting hydrogen sulfide from said cracking zone with said fluid products.

4,115,250
METHOD FOR REMOVING POLLUTANTS FROM CATALYST REGENERATOR FLUE GAS

Robert L. Flanders, and William A. Blanton, Jr., both of San Anselmo, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 666,115, Mar. 11, 1976, Pat. No. 4,071,436. This application Apr. 11, 1977, Ser. No. 786,723
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.[2] C10G *11/02*
U.S. Cl. 208—120 4 Claims

1. In a process for cracking hydrocarbons in the absence of added hydrogen wherein a particulate cracking catalyst comprising a crystalline aluminosilicate zeolite associated with a porous refractory matrix is cycled between a cracking zone and a catalyst regeneration zone, a sulfur-containing hydrocarbon stream is cracked in contact with said catalyst in said cracking zone, and a sulfur-containing flue gas is formed in said regeneration zone by burning sulfur-containing coke off said catalyst with an oxygen-containing gas, the method for reducing the amount of carbon monoxide and sulfur oxides in said flue gas which comprises:

(a) reacting carbon monoxide and oxygen to form carbon dioxide in said regeneration zone in contact with a carbon monoxide oxidation promoter comprising a metal, or compound of a metal, selected from platinum, palladium, iridium, rhodium, osmium, ruthenium, copper and chromium, associated with a particular solid other than said particulate catalyst, said particulate solid being physically admixed with said catalyst;

(b) introducing sufficient molecular oxygen into said regeneration zone to provide an atmosphere therein having a molecular oxygen concentration of at least 0.5 volume percent;

(c) removing sufficient coke from said catalyst in said regeneration zone to provide an average carbon content of less than 0.2 weight percent in catalyst passed from said regeneration zone to said cracking zone;

(d) including in said particulate catalyst a substantially silica-free alumina phase, said alumina phase including about 50 to 5000 parts per million of reactive alumina, said particulate catalyst being substantially free from said metal or compound of said metal;

(e) forming a sulfur- and aluminum-containing solid in said particulate catalyst in said regeneration zone by reacting sulfur trioxide with alumina present in said alumina phase in said catalyst;

(f) removing sulfur from said particulate catalyst and forming hydrogen sulfide in said cracking zone by contacting said sulfur- and aluminum-containing solid with said hydrocarbon stream.

4,115,251
PROCESS FOR REMOVING POLLUTANTS FROM CATALYST REGENERATOR FLUE GAS

Robert L. Flanders, and William A. Blanton, Jr., both of San Anselmo, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 666,115, Mar. 11, 1976, Pat. No. 4,071,436. This application Apr. 11, 1977, Ser. No. 786,724
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.[2] C10G *11/02;* B01J *21/28;* C01B *17/00*
U.S. Cl. 208—120 10 Claims

1. In a process for cracking hydrocarbons in the absence of added hydrogen wherein a particulate cracking catalyst comprising a crystalline aluminosilicate zeolite associated with an amorphous matrix is cycled between a cracking zone and a catalyst regeneration zone, a sulfur-containing hydrocarbon stream is cracked in contact with said catalyst in said cracking zone, and a sulfur-containing flue gs is formed in said regeneration zone by burning sulfur-containing coke off said catalyst

with an oxygen-containing gas, the method for reducing the amount of carbon monoxide and sulfur oxides in said flue gas which comprises:

(a) reacting carbon monoxide and oxygen to form carbon dioxide in said regeneration zone in contact with a carbon monoxide oxidation promoter comprising a metal or comound of a metal selected from platinum, palladium, iridium, rhodium, osmium, ruthenium, copper and chromium:

(b) forming a sulfur- and aluminum-containing solid in said regeneration zone by reacting sulfur trioxide with alumina, said alumina having a surface area of at least 50 square meters per gram and containing 0.1–100% reactive alumina and being included in a particulate solid other than said particulate catalyst, said particulate solid being physically admixed with said particulate catalyst, said particulate solid being substantially free from said metal or metal compound; and

(c) removing sulfur from said particulate solid and forming hydrogen sulfide in said cracking zone by contacting said sulfur- and aluminum-containing solid with said hydrocarbon stream.

4,115,252

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 22, 1976, Ser. No. 744,061
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **21 Claims**

1. In a process for converting a hydrocarbon which comprises contacting said hydrocarbon in a substantially water-free environment at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.05 to about 5 wt.% cobalt and about 0.1 to about 3.5 wt.% halogen; wherein the platinum group metal and catalytically available cobalt are uniformly dispersed throughout said porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state and said catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under said hydrocarbon conversion conditions or in a mixture of these states, the improvement which comprises the addition to the composite of about 0.01 to about 5 wt.% zinc uniformly throughout said porous carrier material.

4,115,253

HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Frank H. Adams, La Grange Park, and H. Peter G. Knapik, Brookfield, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 638,798, Dec. 8, 1975, Pat. No. 4,032,475. This application Jun. 20, 1977, Ser. No. 808,411
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **8 Claims**

1. A process for converting a hydrocarbon which comprises contacting said hydrocarbon in a reaction zone with a sulfided acidic catalyst composite comprising a porous carrier containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, tin, and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; wherein substantially all of the catalytically available cobalt is present in a sulfided state and wherein substantially all of the rhenium is present in a sulfided state or in an elemental metallic state or in a mixture of these states.

4,115,254

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 724,892, Sep. 20, 1976, Pat. No. 4,036,743. This application Jul. 11, 1977, Ser. No. 814,255
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] C01G *35/08*; C07C *5/22*
U.S. Cl. 208—139 **28 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % bismuth and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,115,255

PROCESS FOR HYDROGENATING A COKE-FORMING HYDROCARBON DISTILLATE

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

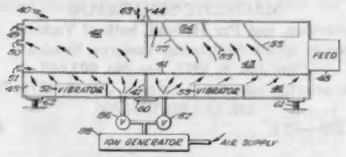
Division of Ser. No. 765,177, Feb. 3, 1977, Pat. No. 4,079,092, which is a continuation-in-part of Ser. No. 687,135, May 17, 1976, Pat. No. 4,018,669, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Oct. 31, 1977, Ser. No. 846,858
Int. Cl.[2] C10G *23/04*
U.S. Cl. 208—143 **10 Claims**

1. A process for hydrogenating a coke-forming hydrocarbon distillate containing di-olefinic and mono-olefinic hydrocarbons, and aromatics, which process comprises reacting said distillate with hydrogen, at a temperature below about 500° F., in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.05 to about 5 wt. % cobalt and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium, catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states, and an alkali metal component, and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

4,115,256
APPARATUS AND METHOD FOR PARTICLE SEPARATION AND GRADING

Hotze Jan de Zeeuw, Suite 143, 9300 Cedar Ave., Minneapolis, Minn. 55420

Continuation of Ser. No. 479,644, Jun. 17, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,446
Int. Cl.[2] B03B 1/00
U.S. Cl. 209—3 18 Claims

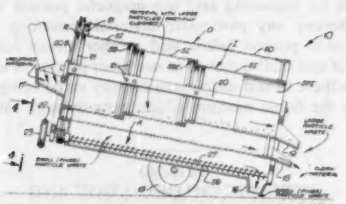


6. A particle grading method comprising the steps of:
introducing the particles into a first chamber, at least the floor of the first chamber having a downward slope from the particle introduction point;
suspending the particles in a generally uniform upward flow of air through the first chamber floor at levels established by particle size and weight;
removing from said first chamber, at a point spaced from the particle introduction point, those particles which are smaller than a predetermined size;
introducing those particles which remain after said removing step into a second chamber, at least the floor of said second chamber having a downward slope from the particle introduction point;
suspending the particles in a generally uniform upward flow of air through the second chamber floor at levels established by particle size and weight, the second chamber flow of air being independent of the first chamber flow of air;
collecting the particles at a plurality of levels in the second chamber flow of air at a point spaced from the second chamber particle introduction point; and
ionizing at least one of said first and second chamber upward flows of air.

4,115,257
GRAIN CLEANER

Leon B. Mugler, Clay Center, Kans., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Oct. 3, 1977, Ser. No. 838,831
Int. Cl.[2] B07B 1/22
U.S. Cl. 209—291 13 Claims

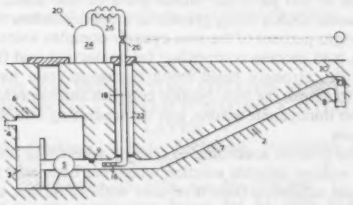


1. A cleaner for grain or the like comprising
a normally inclined cylindrical cleaning drum having open ends and a plurality of sections of decreasing diameter from the upper end of the drum to the opposite end of the drum, the drum having preselected cylindrical surfaces defined with perforations from the upper end thereof to a preselected distance from the opposite end, the apertures of the perforated surfaces being selected and defined relative to the grain or the like to be cleaned for permitting the grain to readily pass through the apertures while preventing large foreign particles from passing therethrough,
another cylindrical cleaning drum having open ends and a diameter larger than the first-mentioned drum and arranged outside of said first drum in a concentric relationship therewith,
means for coupling the drums together for rotation in unison,
said another cleaning drum having a perforated surface from one end thereof to the opposite end, the apertures of the surface being selected and defined relative to the grain or the like to be cleaned for preventing the grain or the like from readily passing through the apertures while permitting relatively small foreign particles to pass therethrough,
means for rotating the cleaning drums in unison at a preselected speed,
means for charging the grain or the like to be cleaned into the inner cleaning drum at the larger diameter end thereof,
and means for discharging the cleaned grain or the like from the outer cleaning drum adjacent the opposite end from which it was charged into the inner cleaning drum.

4,115,258
TREATMENT OF SEWAGE

Kenneth Cecil Smith, Lunga House, Epping Rd., Roydon, Essex, and Michael Ernest Garrett, 9 Sandy Rd., Addlestone, Surrey, both of England

Continuation of Ser. No. 429,744, Jan. 2, 1974, abandoned. This application Jun. 22, 1976, Ser. No. 698,758
Claims priority, application United Kingdom, Jan. 8, 1973, 1028/73; Mar. 1, 1973, 10080/73; Aug. 17, 1973, 38910/73
Int. Cl.[2] C02C 1/02
U.S. Cl. 210—15 10 Claims



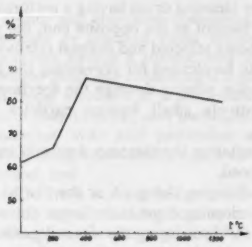
1. A process of treating sewage in a pumped sewer to maintain aerobic metabolism prior to subjecting the sewage to primary treatment which comprises the steps of:
a. sumping sewage to be treated at an inlet end of the pumped sewer;
b. pumping the sewage upwardly through the pumped sewer in a manner to maintain the sewer in a flooded condition;
c. injecting under pressure into the sewage in the pumped sewer, an oxygen-rich gas which contains at least 90% by volume of oxygen in a manner wherein substantially all the gas introduced is dissolved in the sewage being pumped without formation of a discrete gas phase in the pumped sewer such as can cause vapor locks; and
d. providing sufficient oxygen as in (c) to insure that aerobic metabolism is maintained throughout the length of the pumped sewer during residence of the sewage therein.

4,115,259

METHOD FOR REGENERATING DIALYSING LIQUIDS IN HEMODIALYSIS SYSTEMS

Leonardo Bigi, Via S. Giovanni, 15, Mirandola (Modena), Italy

Filed May 10, 1976, Ser. No. 685,024
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—22 A 7 Claims



1. A method for removing phosphate ions particularly from dialysing liquids used in hemodialysis processes, consisting of bringing the dialysing liquid into contact with a mixture having a major proportion of aluminium oxide and a minor proportion of silicon oxide wherein said mixture is free from gel-type alumina and is activated by roasting at a temperature in the range of from 300° to 800° C, and separating said dialysing liquid substantially free from phosphate ions.

4,115,260

SELECTIVE REMOVAL OF IRON CYANIDE ANIONS FROM FLUIDS CONTAINING THIOCYANATES

Noyes L. Avery, Oreland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 7, 1977, Ser. No. 785,475
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—34 10 Claims

1. A process for separating iron cyanide complex anions from an aqueous fluid comprising thiocyanate anions and anions of at least one iron cyanide complex selected from the group consisting of ferrocyanide and ferricyanide, said iron cyanide complex anions being present at a concentration of at least about 100 parts per billion parts of said fluid, and said thiocyanate anions being present at a concentration of at least five weight percent of the iron cyanide complex anion concentration, said process comprising: (a) contacting said fluid with an acrylic, strongly basic anion exchange resin having the ability to adsorb the iron cyanide complex anions preferentially over the thiocyanate anions, and (b) separating said fluid from said resin.

6. The process according to claim 1 wherein at least a portion of sodium chloride solution which has been used to regenerate said exhausted resin is re-used without further treatment for resin regeneration.

4,115,261

PROCESS FOR TREATING DRINKING WATER AND SEWAGE

Herbert Corte, Opladen; Harold Heller, Cologne; Michael Lange, and Otto Netz, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 623,785, Oct. 20, 1975, Pat. No. 4,025,705, which is a continuation of Ser. No. 480,563, Jun. 18, 1974, abandoned. This application Dec. 29, 1976, Ser. No. 755,225
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1973, 2332103
Int. Cl.[2] C02B *1/14*
U.S. Cl. 210—40 15 Claims

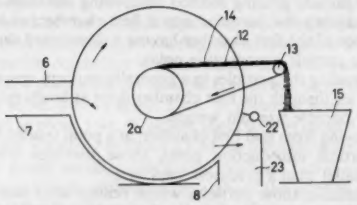
1. A process for removing oleophilic odour- and taste-producing substances from water wherein the water is treated with an insoluble macroporous adsorber resin comprising a matrix based on a crosslinked organic polymer containing aromatic nuclei substitued by substituents consisting essentially of (1) chloromethyl substituents or (2) chloromethyl substituents partially aminated by reacting some of the chlorine atoms thereof with a member selected from the group consisting of ammonia, primary amines and secondary amines.

4,115,262

MAGNETIC SEPARATOR

Rolf Gustavsson, and Per Hedvall, both of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Jun. 6, 1977, Ser. No. 803,645
Claims priority, application Sweden, Jun. 9, 1976, 7606425
Int. Cl.[2] B01D *35/06*
U.S. Cl. 210—42 S 8 Claims



1. A magnetic separator including a horizontally disposed rotatable shaft, a plurality of substantially parallel filter discs attached along said shaft and located in planes perpendicular thereto with gaps between said discs for the passage of a liquid medium to be cleaned, said medium which enters the separator containing ferromagnetic particulate material, said discs containing permanent magnets spaced inwardly of the peripheral edges thereof for producing local magnetic field gradients in the gaps, said discs having a non-magnetic portion in an area outwardly of said magnets along the periphery of said discs, the separator being provided with scraper means for the particulate material which adheres to said discs when the medium passes the gaps, said scraper means entering the gaps between said discs and extending outwardly thereof, a tank for containing the liquid medium to be cleaned, said tank having a liquid inlet and a liquid outlet, said shaft being rotatably mounted on opposing side walls of said tank for immersing said discs in the liquid medium during rotation of said shaft, means disposed below said scraper means, above said outlet and outwardly of said periphery of said discs for generating jets of a fluid, said generating means being directed toward an inner portion of said discs for impacting said non-magnetic portion with the fluid, whereby any particulate material remaining on said non-magnetic portion below said scraper means during the rotation of said shaft is moved to said inner portion of said discs so as to adhere to said magnets to thereby avoid being flushed away by the liquid medium which exits through said liquid outlet.

4,115,263

PERIODIC CHLORINATION AND SUPERCHLORINATION OF RECIRCULATING SWIMMING POOL WATER

Robert Frederic James, Thornhill, Canada, assignor to Auto-Chlor Inc., Mississauga, Canada

Filed Oct. 20, 1976, Ser. No. 734,350
Int. Cl.[2] B01D *11/02;* C01B *3/06*
U.S. Cl. 210—60 4 Claims

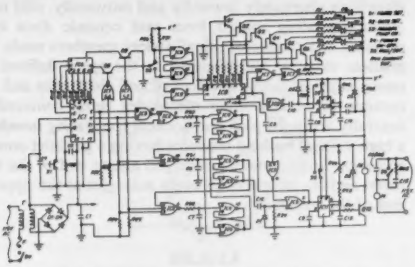
1. A method for maintaining a body of swimming pool water, of known volume fit for human use, comprising continuously repeating a cycle consisting of

(a) the step of introducing into said body of water a selected amount of free chlorine yielding compound adapted to

immediately raise the free chlroine concentration to a value within the established effective range of the order of between 0.5 to 10 ppm and

(b) the step of recirculating said body of water for a selected timed interval measured from the commencement of said introduction step during which interval the free chlorine concentration diminishes to a point approaching the lower limit of said established effective range,

(c) repeating said introduction step of said selected amount of said compound and said recirculation step for said selected timed interval successively, several times, immediately upon the elapse of the preceding timed interval of said recirculation step,



(d) then immediately upon cessation of said several repeated introduction steps and recirculation steps introducing approximately twice the selected amount of said compound so as to immediately raise the free chlorine concentration substantially above said first mentioned value, and

(e) finally recirculating said body of water over the same timed interval corresponding to said first mentioned timed interval measured from the commencement of the last mentioned introduction of said compound.

4,115,264

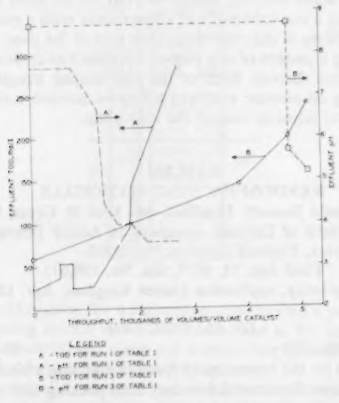
METHOD OF PURIFYING POLLUTED WATER

William C. McCarthy, and Robert O. Dunn, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 572,044, Apr. 28, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 711,033

Int. Cl.² C02B *1/34*

U.S. Cl. 210—63 R **22 Claims**


EFFLUENT TOC, mg/l
EFFLUENT pH
THROUGHPUT, THOUSANDS OF VOLUMES/VOLUME CATALYST
LEGEND
A - TOC FOR RUN 1 OF TABLE I
A - pH FOR RUN 1 OF TABLE I
B - TOC FOR RUN 3 OF TABLE I
B - pH FOR RUN 3 OF TABLE I

1. In the liquid phase catalytic oxidation of organically polluted water, containing no more than about 1 part of alkali metal ions per million parts of polluted water, to reduce the total oxygen demand of said polluted water by contacting said polluted water with an oxygen-containing gas and a catalyst effective to promote such liquid phase oxidation comprising zinc aluminate promoted with at least one metal active for initiating oxidative reactions, the method of increasing the catalyst life comprising adding a sufficient amount of alkali metal ion to the organically polluted water prior to the catalytic oxidation to increase the throughput that can occur before the pH breakthrough occurs.

4,115,265

METHOD AND APPARATUS FOR DEHYDRATING SUSPENSION

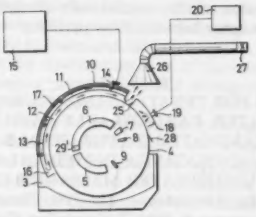
Wilhelm Otte, Bochum; Günther Bergmann, Dinslaken, and Kar-Heinz Kubitza, Essen-Heisingen, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 16, 1976, Ser. No. 751,206

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558794

Int. Cl.² B01D *33/10*

U.S. Cl. 210—68 **14 Claims**



1. A method for the dehydration of an aqueous suspension which comprises applying said suspension to the surface of a vacuum filter, directing steam along an imperforate partition means parallel to said surface in one direction, thereafter passing said steam in the opposite direction into contact with the filter cake on said surface whereby substantially the entire effective area of said filter cake is acted upon by steam of uniformly high temperature, and eliminating condensation of said steam on said filter cake by said partition means.

4,115,266

METHOD FOR SEPARATING FOREIGN SUBSTANCES BY MEANS OF A FILTER FORMING A FLOATING LAYER

Katsutoshi Ohshima, 2-31-1, Tokiwadai, Itabashiku, Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,689

Claims priority, application Japan, Jul. 14, 1976, 51-82896

Int. Cl.² B01D *23/24*

U.S. Cl. 210—80 **6 Claims**

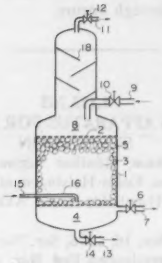
1. A method for continuously separating foreign substances from a liquid containing same by filtration, which comprises:

(a) passing a liquid containing foreign substance through a filtration zone that is filled with a floating mass of particulate filter material having a specific gravity equal to or lower than that of said liquid and being disposed in an unfixed position in said floating mass so that they may move with respect to each other within said floating mass,

(b) continuing the passage of said liquid through said floating mass until said foreign substances (1) adhere onto the surfaces of said filter particles, and (2) slowly grow into aggregates of foreign substances that are peeled from the filter particles by the contacting motion of said filter particles with each other in said floating mass brought about by the flow of said liquid therethrough, and

(c) allowing resulting aggregates of foreign substances peeled from said filter particles to separate from said floating mass, and

(d) removing separated aggregates of foreign substances by causing them to move outwardly through said floating



mass countercurrently to the liquid passing through said floating mass,

whereby the surfaces of said filter particles are always kept clean and filtration can be continuously carried out without clogging of the space between filter particles.

4,115,267

APPARATUS FOR TREATING AND DEGERMINATING BATH WATER, PARTICULARLY BATH WATER CONTAMINATED BY THE GERM BACT. *PSEUDOMONAS PYOCANEA*, IN MEDICAL TUB-BATHS AND UNDERWATER MASSAGE BATHS

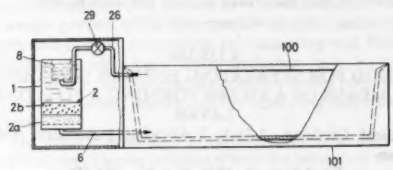
Bruno Bachhofer Säntisstrasse 85, 7981 Bavendorf; Anton Locher, Bergstrasse 6, 7981 Torkenweiler; Gerhard Skirde, Trelder Dorfstrasse 4, 2110 Buchholz-Trelde, and Hansjörg Quistorff, Babendiekstrasse 17, 2000 Hamburg-Blankenese, all of Germany

Division of Ser. No. 666,485, Mar. 12, 1976, Pat. No. 4,053,403. This application Feb. 11, 1977, Ser. No. 767,738

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1975, 2511499; Feb. 20, 1976, 2606838

Int. Cl.[2] C02B *1/38, 3/08*

U.S. Cl. 210—136 **9 Claims**



1. A bath-tub assembly adapted particularly for medical bath applications comprising a bath water treating and degerminating assembly adapted particularly to remove the germ bact. pseudomonas pyocyanea from bath water; a cabinet in which is mounted a bath-tub body and a filter assembly; the filter assembly including a filter housing; a two-layer filtering medium within the filter housing, the filtering medium being charged with bromine or hydrobromic acid, a first inferior layer of said filtering medium consisting of a mixture of filter gravel and mineralized charcoal, and a second superior layer of said filtering medium consisting of fine grain activated charcoal; a feed line connecting a lower portion of the filter housing with the bath tub; a return line connecting an upper region of the filter housing with the bath-tub; a circulating pump connected in said return line; an ozonizer within said filter housing above said filtering medium so that the bath water circulated through said filter housing contacts the outer surface of the ozonizer and cools this outer surface; an air supply source for the ozonizer, and a mixing assembly with a nozzle head mounted on the ozonizer and connected to said water feed line;

said ozonizer comprising a plurality of outer electrodes in the form of solid cup-shaped annular discs of a heat conductive material, a plurality of annular discs of a ceramic material serving as dielectrics and a plurality of inner electrodes in the form of sheet metal discs, outer and inner electrodes and the dielectric discs being stacked in a rigid compound, a plurality of discharge spaces defined between the ceramic discs and the inner electrodes, the discharge spaces permitting air flow in opposite radial directions alternately inwardly and outwardly, said inner electrodes being spaced from said ceramic discs by a plurality of intermediate small spacer members made of a resilient material and disposed in the space defined between adjacent facing surfaces of said electrodes and said ceramic discs, said inner electrodes being centered by centrally arranged plug-and-socket type mating members; a high voltage bushing insulator having a gas inlet conduit and a gas line connector arranged at one end of the ozonizer, and the nozzle head being arranged at the opposite end of the ozonizer.

4,115,268

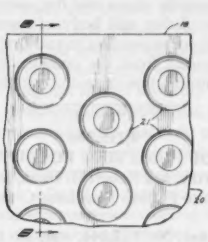
WASTE WATER TREATMENT ROTOR

Christopher P. Thissen, 305 - 2nd Ave. SW., Austin, Minn. 55912

Filed May 16, 1977, Ser. No. 796,874

Int. Cl.[2] C02C *1/02*

U.S. Cl. 210—150 **8 Claims**



1. A rotor for a waste water biological treatment system, comprising

a rotatable shaft, and

a waste water treating module affixed on the shaft and including a convolute of stiff sheet plastic with a multiplicity of turns in the convolute, each turn of the sheet plastic having a pattern of cup shaped irregularities embossed on one face thereof, each of the cup shaped irregularities having an annular wall and a bottom portion welded to the next adjacent turn in the convolute.

4,115,269

RANDOM PACKING MATERIALS

John Reginald Bennett, Lingfield, and Kent R. Greer, Marple Bridge, both of England, assignors to Acalor International Ltd., Sussex, England

Filed Apr. 11, 1977, Ser. No. 786,671

Claims priority, application United Kingdom, Apr. 15, 1976, 15758/76

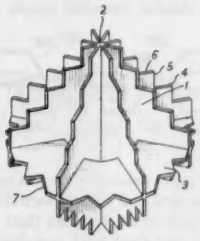
Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—150 **13 Claims**

1. A bed for the treatment of fluids comprising a plurality of packing units characterized in that each packing unit consists essentially of a plurality of fins disposed around an axis lying substantially in the plane of each of the fins, and at least one generally part annular reinforcing member between each angularly adjacent pair of fins in a plane substantially perpendicular to the axis, holding said fins in spaced relationship to one

another, the outward-facing edges of the fins being serrated, the packing units being so shaped that they take up a random configuration in the bed, with contact between adjacent units being predominantly along the edges of the fins and the reinforcing members, whereby fluid applied to the bed is distributed substantially evenly therethrough.

7. A bed for the treatment of fluids comprising a plurality of packing units characterized in that each packing unit consists essentially of a hollow tube having a longitudinal axis, a plurality of fins radiating from the outer surface of the tube substan-



tially in the same plane as the axis of the tube, and at least one generally part annular reinforcing member between each angularly adjacent pair of fins in a plane substantially perpendicular to the axis of the tube, holding said fins in spaced relationship to one another, the outward-facing edges of the fins being serrated, the packing units being so shaped that they take up a random configuration in the bed, with contact between adjacent units being predominantly along the edges of the fins and the reinforcing members, whereby fluid applied to the bed is distributed substantially evenly therethrough.

4,115,270

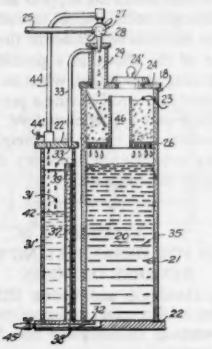
CHLORINATOR FOR SWIMMING POOLS

Ash S. Phillips, 1944 Park Ave., San Jose, Calif. 95126

Continuation-in-part of Ser. No. 667,262, Mar. 16, 1976, Pat. No. 4,067,808. This application Oct. 31, 1977, Ser. No. 846,764

Int. Cl. E04h *3/20*

U.S. Cl. 210—169 **5 Claims**



1. A chlorinator for a swimming pool having a pool water recirculating system in which a drain line at the base of the pool is connected to a pump and a return line leading back into the pool, a bypass sytem comprising:

(1) a vertically arranged container located above the return line adapted to hold a supply of chlorine concentrate solution;

(2) a steeping chamber arranged in the upper end of said vertically arranged container;

(3) said steeping chamber having a perforated bottom;

(4) a supply of dry chlorine containing material located in said steeping chamber on said perforated bottom;

(5) a pool water supply conduit having one end connected to an upstream zone of the return line and its opposite end disposed above said steeping chamber;

(6) a regulating valve in said pool water supply conduit for metering the flow of pool water therefrom and for discharging the pool water in a measured rate into the upper region of said steeping chamber to dissolve said chlorine containing material; the lower portion of said vertically arranged container collecting a supply of aqueous chlorine concentrate therein;

(7) a chlorine concentrate supply tube arranged vertically adjacent said container with its upper end disposed just below the level of said perforated bottom and having its lower end communicating with the lower end of said container for receiving chlorine concentrate solution therefrom;

(8) a mixing chamber arranged vertically adjacent said container in a position to receive chlorine concentrate solution from the open upper end of said chlorine concentrate supply tube as it overflows therefrom due to the added weight of pool water at rest upon the supply of aqueous chlorine concentrate in said vertically arranged chamber, said mixing chamber being a tubular member parallel to and circumscribing said chlorine concentrate supply tube and having its lower end closed except for its communication with the downstream zone of the return line;

(9) said steeping chamber and said mixing chamber having their upper ends closed;

(10) conduit means for communicating theupper ends of said steeping chamber with the upper end of said tubular member of the mixing chamber for equalizing the pressure therein to allow the chlorine concentrate solution transferred from the container to rise within said chlorine concentrate supply tube dependent upon the measured rate of discharge of pool water into the upper region of said steeping chamber and container;

(11) a feeder member for communicating the lower end of said mixing chamber with a downstream zone of the return line for discharging a metered quantity of chlorine concentrate solution into the return line and the pool water therein as it returns to the swimming pool and,

(12) a pool water supply conduit having one end connected to the upper end of said mixing chamber for discharging water at a measured rate into said mixing chamber.

4,115,271

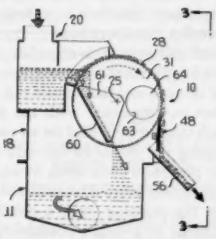
ROTARY DRUM SCREEN

William H. Holt, Lewiston, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,704

Int. Cl.[2] B01D *33/36*

U.S. Cl. 210—247 **8 Claims**



1. A structure for removing entrained solids from a liquid, said structure comprising a generally cylindrical screen, means for effecting rotation of said screen about an axis in a selected direction, supply means for directing flowing liquid and solids onto said screen throughout a preselected portion of its rota-

tion with the liquid passing into the interior of said screen primarily only in an upper quadrant of the rotation of said screen wherein said screen is moving upwardly and screened-out solids remaining on the exterior of said screen, doctor means displaced from said supply means in the direction of rotation of said screen for removing solids from the exterior of said screen, and single flow directing means located within the interior of said screen for directing essentially all of the liquid passing into the interior of said screen through the interior of the screen and out through a lower portion of said screen between said doctor means and said supply means in the form of a concentrated flowing stream, said flow directing means being in the form of a downwardly sloping stream supporting and defining baffle fixedly mounted within said screen, said sloping baffle having an upper portion underlying said preselected portion of said screen rotation and a lower end terminating adjacent the interior of said screen.

4,115,272

APPARATUS FOR SEPARATION OF CHEMICAL COMPOUNDS AND PRODUCTION OF STERILE SOLUTIONS

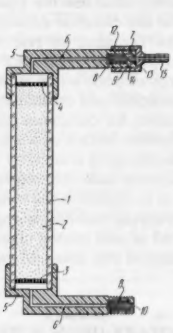
Rashid Mustafievich Mukhamedyarov, ulitsa Kasatkina,3; Boris Andreevich Smirnov, ulitsa Borisa Galushkina, 17, kv. 26; Stanislav Vasilievich Sery, ulitsa Malaya Schukinskaya, 10a, kv. 42; Tatyana Dmitrievna Titkova, ulitsa Festivalnaya, 22, korpus 4, kv. 490, and Anatoly Ivanovich Lokalov, ulitsa Gamalei, 19, korpus 2, kv. 81, all of Moscow, U.S.S.R.

Filed Dec. 27, 1976, Ser. No. 754,563

Claims priority, application U.S.S.R., Dec. 31, 1975, 2306714

Int. Cl.² B01J *1/06*

U.S. Cl. 210—266 **2 Claims**



1. An apparatus for the separation of chemical substances and the production of sterile solutions which comprises a column, an ion exchange agent placed into said column; at least one filter in said column; plugs closing said column at the ends thereof; the body of each plug containing a piercing duct having an inner expansion chamber; a resilient stopper placed in each of said expansion chambers whose free extended length exceeds the length of said expansion chamber, and where each resilient stopper has longitudinal notches on its external surface extending over the stopper end facing said column so that said longitudinal notches communicate with the piercing duct; a closing cone on each stopper provided on an end opposite to its notched end engaging the edges of the end portion of said piercing duct of the plug; said cone being located in said expansion chamber in a direction away from said column thus ensuring a tight seal for the piercing duct; a cover for each plug adapted for attachment to a vessel containing chemical substances; an internal hollow pressure rod for each of said covers, having a transverse portion at the end thereof; said rod passing through the end portion of the piercing duct of the plug and engaging with its transverse portion, the closing cone of the stopper so that upon attachment of the cover to said plug, the stopper can be compressed by said pressure rod, thereby allowing communication with the piercing duct and the vessel containing said chemical substances.

4,115,273

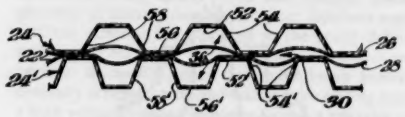
WAVE PATTERNED SUPPORT FOR DIALYZER MEMBRANE

Thomas W. Winstead, Baltimore, Md., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Nov. 15, 1976, Ser. No. 742,359

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 A **10 Claims**



1. Membrane support means for use in a mass transfer device of the type having first and second sections of flexible membrane positioned to provide between their inner faces a flattened passage for one fluid with membrane support means contacting the outer faces of the membrane to define the passage for the one fluid and also to provide passage for another fluid to wash against the outer faces of the sections of membrane, the membrane support means consisting of a continuous sheet of contoured, substantially uniform thickness material sufficiently rigid to provide spaced apart generally parallel membrane support surfaces, one on each side of the sheet, the support surface on one side being defined by a series of spaced apart summits of hollow protrusions extending outwardly toward the one support surface and the support surface on the other side being defined by another series of spaced apart summits of hollow protrusions extending outwardly toward the other support surface, the spacing apart between the summits which define the support surface on one side being sufficiently small with respect to the space between the two support surfaces to insure that under operating pressures the membrane contacts only the summits and does not flex inwardly between the summits toward the support surface on the other side to the extent that passage for the other fluid becomes occluded, the membrane support means being characterized in that the summits which define the support surface on one side of the sheet are arranged with respect to each other, and also with respect to the summits which define the support surface on the other side of the sheet, in a predetermined pattern dimensioned and arranged such that, when an elongated length of the sheet is formed into a roll having a predetermined inner peripheral dimension and a predetermined outer peripheral dimension, the pattern will never be directly superimposed upon itself thereby avoiding the tendency of corresponding hollow protrusions to interdigitate.

4,115,274

APPARATUS FOR DESALINATING WATER BY REVERSE OSMOSIS

Karl Böddeker, Hamburg, and Walter Hilgendorff, Tespe, both of Fed. Rep. of Germany, assignors to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH., Fed. Rep. of Germany

Filed Dec. 13, 1976, Ser. No. 750,156

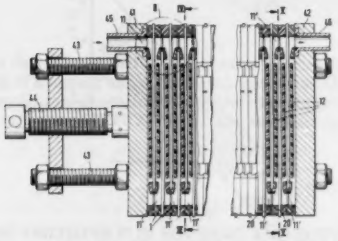
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556210

Int. Cl.² B01D *13/00;* **C02B** *1/82*

U.S. Cl. 210—321 R **14 Claims**

1. An apparatus for desalinating water by reverse osmosis, which includes a first pressure plate having inlet means for the water to be desalinated, a second pressure plate arranged opposite and in spaced relationship to said first pressure plate and provided with outlet means for the brine of the desalinated

water, a stack of substantially identical module plates arranged between said first and second pressure plates but with each two adjacent module plates arranged so as to complement each other, a plurality of porous disc means covered on opposite sides with membranes and each having a peripheral outlet section forming an outlet for desalinated water, said disc means being clamped between respective adjacent module plates in such a way that every two adjacent porous disc means have their peripheral outlet sections angularly offset about a common axis, clamping means operatively connected to said pressure plates for clamping said module plates therebetween and thereby said disc means between module plates, said disc



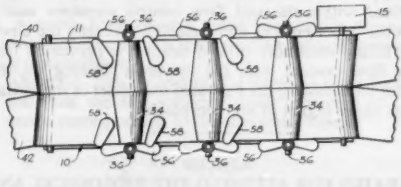
means together with adjacent module plates defining equal pressure and equal flow-geometric water chambers for receiving water to be desalinated, said chambers being arranged in series with regard to each other and fluid conveying means establishing communication with said inlet and outlet means, said porous disc means being sandwiched with said fluid conveying means so as to force fluid passing from said inlet means to said outlet means to flow around said porous disc means alternately in opposite direction, those surfaces of the module plate dividing walls which define the regions of the floor of said water chambers having a roof-shaped profile, the ridge portion of said roof-shaped profile being located transversely and centrally between said inlet and outlet means.

4,115,275

SLUDGE DEWATERING APPARATUS

William E. Morris, 1831 N. Douglas, Appleton, Wis. 54911

Filed Apr. 14, 1977, Ser. No. 787,338
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—386 **37 Claims**



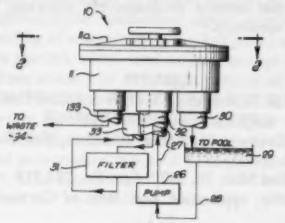
1. Apparatus for dewatering sludge comprising a primary dewatering section and a secondary dewatering section which immediately follows the primary dewatering section, said primary dewatering section having an endless filter means sloped inwardly to form a central trough along the top run on which the sludge is carried through the primary dewatering section for drainage of water through the filter means, pressure rollers extending crosswise of and longitudinally spaced above the top run of the filter means and operative to apply pressure onto the sludge during passage through the primary dewatering section, and means for feeding the sludge onto the head end portion of the endless filter means, said secondary dewatering section having an endless non-filtering means contoured to slope downwardly towards the side along the top run for drainage of water over the sides of the endless member on which the sludge is supported during travel through the secondary dewatering section, pressure rollers extending crosswise and longitudinally spaced above the top run of the non-filtering member and operative to apply pressure to the sludge during passage through the secondary dewatering section, means for conveying the sludge from the primary dewatering section to the head end portion of the non-filtering member, and means for driving the endless filter means and endless non-filtering member in the primary and secondary dewatering sections respectively.

4,115,276

MULTI-PORT BACKWASH VALVE

Virgil M. Kelly, Los Angeles, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Apr. 4, 1977, Ser. No. 783,978
Int. Cl.[2] B01D *35/22*
U.S. Cl. 210—425 **19 Claims**



1. In a multi-ported backwash valve for a swimming pool and filter, the combination comprising

(a) a valve rotor and a body having five ports communicating with the rotor, said ports including
  (i) a pool water inlet port,
  (ii) a first outlet port for water delivery to the pool,
  (iii) a second outlet port for water delivery forwardly through the filter,
  (iv) a third outlet port for water delivery reversely through the filter, and
  (v) a fourth outlet port for water delivery to waste,

(b) the rotor having water flow directing chamber structure characterized in that when the rotor is in a FILTER position the second outlet port is placed in communication with the water inlet port via the chamber structure, and the third and first ports are placed in communication through the rotor chamber structure, and

(c) when the rotor is placed in a BACKWASH position, the third port is placed in communication with the water inlet port via the rotor chamber structure, and the second and fourth ports are placed in communication through the rotor chamber structure,

(d) there being a plug carried by the rotor for rotation therewith and to plug the fourth port when the rotor is in said FILTER position, and to plug the first outlet port when the rotor is in said BACKWASH position.

4,115,277

BLOOD FILTERING APPARATUS OF GRADUATED FIBER DENSITY

Roy L. Swank, Portland, Oreg., assignor to Pioneer Filters, Inc., Beaverton, Oreg.

Filed Jun. 17, 1977, Ser. No. 807,378
Int. Cl.[2] B01D *23/20*
U.S. Cl. 210—436 **8 Claims**

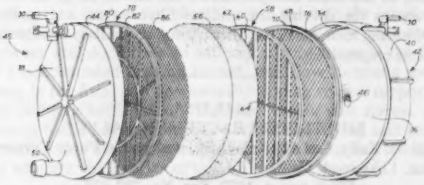
1. A high volume, continuous filter for debris-containing blood, comprising:

(a) a blood flow chamber having a blood inlet port at one end and a blood outlet port at the opposite end,

(b) a filter mat of fibrous material extending longitudinally in

the chamber and interposed between the inlet and outlet ports, and

(c) a plurality of laterally spaced mat-indenting members in the chamber engaging the upstream end of the mat and indenting the mat through a portion of its longitudinal



thickness in the areas of said indenting members for causing the fibrous material to fluff out in the spaces between the indenting members and thereby form regions of decreasing mat density progressively outward from said indenting members.

4,115,278

CONICAL FILTER BASKET FOR A CONTINUOUSLY OPERATING CENTRIFUGE

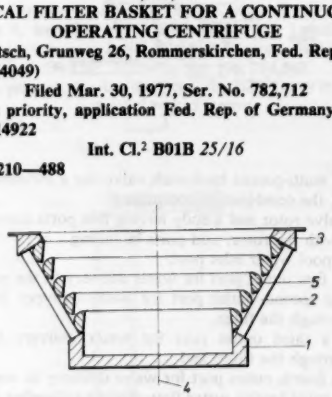
Willi Fritsch, Grunweg 26, Rommerskirchen, Fed. Rep. of Germany (4049)

Filed Mar. 30, 1977, Ser. No. 782,712

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614922

Int. Cl.[2] B01B *25/16*

U.S. Cl. 210—488 **9 Claims**



1. A filter basket having a frusto-conically shaped lateral sieve surface for a continuously operating centrifuge for the separation of solids from a solids-liquid mixture, said basket having an axis of rotation and including a base extending transversely of the axis of rotation, an end ring extending transversely of the axis of rotation and spaced from said base, the sieve extending around the axis of rotation between said base and said end ring and said sieve surface comprising at least one bar-like member of uniform cross section forming a plurality of ring-like turns arranged about the axis of rotation, wherein the improvement comprises that said ring-like turns are equally spaced apart and arranged in a step-like formation with each said turn closer to said end ring than an adjacent said turn and being spaced radially outwardly from the adjacent said turn, said bar-like member having a first surface extending in the direction between said base and said end ring and having a circumferential edge closer to said end ring extending inwardly toward the axis of rotation and a second surface facing in the opposite direction from said first surface, said ring-like turns being disposed in overlapping relation in the direction of the axis of rotation of said basket and in a pair of adjacent ring-like turns said first surface of said turn closer to said end ring and the second surface of said turn closer to said base forming a pocket having an inlet opening to the interior of said basket and an outlet opening toward the exterior of said basket and said first and second surfaces forming said basket being disposed in converging relation from the inlet toward the outlet of said pocket.

4,115,279

APPARATUS FOR SEPARATION OF OIL FROM OIL AND WATER MIXTURES

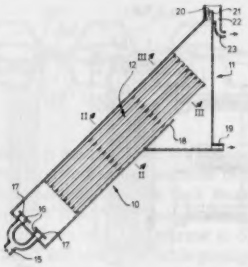
Kenneth Herman Toft, Stoke-on-Trent, England, assignor to Simon-Hartley Limited, England

Continuation of Ser. No. 556,958, Mar. 10, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,642

Claims priority, application United Kingdom, Mar. 26, 1974, 13480/74

Int. Cl.[2] B01D *12/00*

U.S. Cl. 210—521 **10 Claims**



1. Apparatus for separating oil from a mixture of oil and water, comprising a receptacle having a lower region provided with a bottom inlet for introduction of a mixture to be separated and an upper region provided with an outlet for removing separated oil, means supporting within said receptacle an assembly comprised by a plurality of upwardly inclined laminar flow control members of inverted channel shape from end-to-end arranged in laterally spaced apart side-by-side relation in each of a plurality of spaced vertical levels, the lower ends of said members being disposed within said lower region and spaced above the floor or said receptacle for receiving the introduced mixture at the bottom of said assembly for upward flow therethrough for separation of the oil by contact with the under-surfaces of said members, and the upper ends of said members being disposed within said upper region for discharge of the oil, thus constrained, from the assembly at the upper ends of said members, means constraining said mixture for inclined upward flow in said assembly between the lower and upper regions, means in said upper region whereby the separated remainder of the mixture falls downwardly out of the assembly through spaces between the members prior to reaching the upper ends of the members, while upwardly flowing oil is confined within the said flow control members until it reaches the upper ends of said members, whereby the downwardly falling remainder of said mixture is prevented from counter flow contact with the upwardly flowing oil, and means for withdrawing the separated remainder of the mixture from the upper region of said receptacle.

4,115,280

APPARATUS FOR ALTERING THE BIOLOGICAL AND CHEMICAL ACTIVITY OF MOLECULAR SPECIES

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

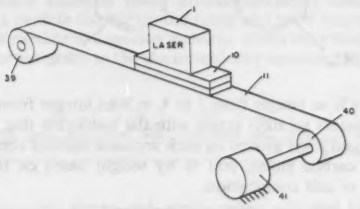
Division of Ser. No. 88,528, Nov. 12, 1970, Pat. No. 3,941,670. This application Jul. 31, 1975, Ser. No. 601,122

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—527 **56 Claims**

1. Apparatus for altering by irradiation the biological activity of macromolecular species on a surface which moves relative to the incident radiation, that comprises, in combination, means for generating laser radiation, means for frequency selection, tuning, and/or modulation of the radiation to produce radiation which directly excites vibrational and rotational and, potentially, electronic states of the irradiated species, said radiation being in the infrared region of the electromagnetic

spectrum, means for directing the beam of laser radiation upon the surface, means for effecting relative movement between the surface and the irradiating beam in any combination of longitudinal and transverse directions so that each part of the



surface that is irradiated by the beam is irradiated for only a fraction of a second, and means for spreading the characteristically small cross-dimensional laser beam to enlarge the portion of the surface irradiated as the surface passes across the beam.

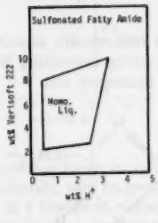
4,115,281
COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423. This application Jan. 26, 1976, Ser. No. 652,558

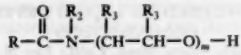
Int. Cl.[2] D06M *13/38*

U.S. Cl. 252—8.8 **54 Claims**



1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of:

I. About 0.5–25% by weight of a softening agent for textile materials, the said softening agent consisting of a fatty amide corresponding to the structural formula



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R_2 is selected from the group consisting of hydrogen and

wherein R is as defined above, R_3 is selected from the group consisting of hydrogen and monovalent alkyl radicals containing 1–2 carbon atoms, and *m* is 2–6;

II. About 3–50% by weight of an acidic souring agent for laundered textile materials selected from the group consisting of hydrofluorosilicic acid, ammonium silicofluoride, zinc silicofluoride, ammonium acid fluoride, potassium acid fluoride and orthophosphoric acid; and

III. About 25–96.5% by weight of water;

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

4,115,282
BIODEGRADABLE GREASE COMPOSITION

Hans Dieter Grasshoff, Hamburg, Fed. Rep. of Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,579

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554077

Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—18 **14 Claims**

1. A grease composition comprising from 10 to 95 weight percent water, from 0.2 to 10 weight percent of a water-soluble, vegetable-derived thickening agent selected from the group consisting of ammonium and alkali metal salts of alginic acid and the methyl-, ehtyl- and carboxymethyl derivatives of cellulose, from about 1 to 50 weight percent of an animal or vegetable fat, oil or corresponding glyceride and from about 0.05 to 5 weight percent of an emulsifying agent selected from the group consisting of sodium and potassium oleate and stearate, sorbitol monooleate, glycerol monostearate and polyioxyethylene sorbitol monooleate.

4,115,283
ANTIFRICTION COMPOSITION

Donald G. Needham, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 640,089, Dec. 12, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 861,078

Int. Cl.[2] C10M *5/00, 7/00;* **F16C** *00/00;* **F16D** *69/00*

U.S. Cl. 252—12.4 **49 Claims**

1. A self-lubricating composition comprising (a) heat-treated poly(arylene sulfide) in the range of about 30 to 50 weight percent, (b) at least one solid lubricating component in the range of about 15 to 25 weight percent, (c) at least one reinforcing material in the range of about 15 to 25 weight percent, and (d) at least one filler in the range of about 10 to 20 weight percent, based on the total weight of said composition,

wherein said (b) solid lubricating component is molybdenum disulfide, molybdenum diselenide, tungsten disulfide, tungsten diselenide, graphite, polytetrafluoroethylene, or mixture,

wherein said (c) reinforcing material is glass fibers, asbestos fibers, carbon fibers, boron fibers, ceramic fibers, or mixture,

wherein said (d) filler is calcium carbonate, titanium dioxide, barium sulfate, hydrated aluminum silicates, carbon black, red iron oxides, diatomaceous earth, admixtures thereof, or admixtures with antimony trioxide.

4,115,284
BRAKE GREASE COMPOSITIONS

Hirotugu Kinoshita, Yokohama; Makoto Sekiya, and Nobuo Makino, both of Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,691

Claims priority, application Japan, Jun. 21, 1976, 51-72269

Int. Cl.[2] C10M *1/10, 3/02*

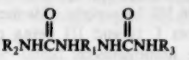
U.S. Cl. 252—29 **7 Claims**

1. A brake grease composition comprising:

(A) a polyoxypropylene glycol monoether as the lubricating base oil, having a pour point of not higher than −20° C., a flash point not lower than 200° C. and a viscosity of not lower than 8 cSt at 98.9° C. and

(B) a gelling agent as the thickening agent, consisting of at

least one diurea compound represented by the general formula



wherein R_1 is a divalent aromatic hydrocarbon radical, and R_2 and R_3 are each of cyclohexyl, a cyclohexyl derivative group having 7–12 carbon atoms or an alkyl group having 8–20 carbon atoms; and wherein the gelling agent has a cyclohexyl or cyclohexyl derivative group content of at least 20% as calculated from the formula

$$\frac{\text{No. of cyclohexyl or cyclohexyl derivative group}}{\text{No. of cyclohexyl or cyclohexyl derivative group} + \text{No. of alkyl group}} \times 100\%.$$

4. A brake grease composition according to claim 1, further comprising at least one solid lubricant selected from the group consisting of molybdenum disulfide, graphite, zinc oxide and polytetrafluoroethylenes.

4,115,285

CUTTING OIL ADDITIVES

Jan Willem van Hesden, Baulkham Hills, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 805,670

Int. Cl.[2] C10M *1/44, 3/38, 7/24;* **C05B** *11/16*

U.S. Cl. 252—32.5 **5 Claims**

1. A fluid composition adapted for use as a cutting oil comprising a hydrocarbon oil and from about 0.1 to about 3 wt.% of a partially neutralized aluminum acid alkylorthophosphate.

4,115,286

LUBRICANT ANTIWEAR ADDITIVES CONTAINING SULFUR AND BORON

Bernard A. Baldwin; Ralph P. Williams, both of Bartlesville, Okla., and Raymond Rohde, Sun City, Ariz., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1977, Ser. No. 802,082

Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*

U.S. Cl. 252—46.3 **25 Claims**

1. A lubricating composition comprising a major amount of an oil based lubricant and a minor antiwear improving amount of at least one mercapto-substituted boron-containing compound selected from the group consisting of 2-hydroxy-4-(mercaptohydrocarbyl)-1,3,2-dioxaborolanes and alkylammonium bis[(mercaptohydrocarbyl)ethylenedioxy]borates.

5. As a novel composition of matter a 2-hydroxy-4-(mercaptohydrocarbyl)-1,3,2-dioxaborolane.

7. As a novel composition of matter an alkylammonium bis[(mercaptohydrocarbyl)ethylenedioxy]borate.

9. As a novel composition of matter a hydrogen bis[(mercaptohydrocarbyl) ethylenedioxy]borate.

4,115,287

LUBRICATING COMPOSITIONS

Terence Colclough, and Brian Swinney, both of Oxford, England, assignors to Exxon Research and Engineering Company, Linden, N.J.

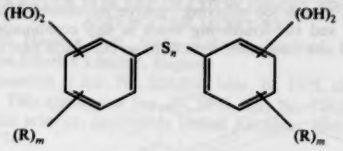
Filed Mar. 18, 1977, Ser. No. 779,060

Claims priority, application United Kingdom, Apr. 22, 1976, 16360/76

Int. Cl.[2] C10M *1/38, 3/32, 5/28, 7/36*

U.S. Cl. 252—48.2 **11 Claims**

1. A lubricating oil composition comprising a major amount of a lubricating oil and from 0.01 to 10% by weight of a sulfurized alkyl dihydroxy benzene of the general formula:



where n is an integer from 1 to 4, m is an integer from 1 to 3, R represents an alkyl group with the restriction that at least one of said alkyl groups on each aromatic nucleus contains at least 7 carbon atoms, said % by weight based on the total weight of said composition.

4,115,288

LUBRICANTS CONTAINING SUBSTITUTED TRIAZOLES AS ANTIWEAR AGENTS

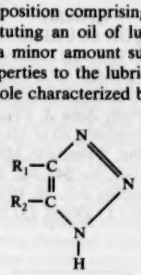
Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,113

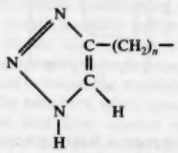
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—50 **8 Claims**

1. A lubricant composition comprising a major amount of a lubricant base constituting an oil of lubricating viscosity or greases thereof and a minor amount sufficient to impart improved antiwear properties to the lubricant composition of a 1,2,3-substituted triazole characterized by the formula:



where R_1 and R_2 are individually selected from the group consisting of an alkyl group containing from 1 to 18 carbon atoms; an aryl group; hydrogen; and



and wherein at least one of R_1 and R_2 is other than hydrogen and where n is an integer from 5 to 15.

4,115,289

DRY POWDERED OR LIQUID DEVELOPER COMPOSITIONS

Frederick O. Bach, Costa Mesa, Calif.; Leo N. Chapin, Park Ridge, and Robert Freed, Lincolnwood, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

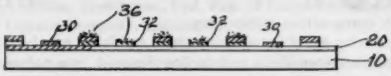
Continuation-in-part of Ser. No. 385,101, Aug. 2, 1973, abandoned, which is a continuation of Ser. No. 156,982, Jun. 25, 1971, abandoned, which is a division of Ser. No. 836,415, Jun. 25, 1969, Pat. No. 3,630,729. This application Mar. 15, 1976, Ser. No. 666,872

Int. Cl.[2] G03G *9/10, 9/12*

U.S. Cl. 252—62.1 P **5 Claims**

1. A developer composition for color development of latent electrostatic imaged portions of an electrophotographic sheet having interspersed photoconductive sections sensitized in latent electrostatic imaged portions to different segments of the visible light spectrum and containing colorless dispersed solu-

bilizable dye particles which produce color when reduced to the solubilized state corresponding to the portions of the visible light spectrum other than that for which the particular section is sensitized, said developer composition consisting of a substantially colorless finely divided developer compound having a particle size within the range of 2 to 30 microns and which is capable of acquiring a charge within the triboelectric series for attraction to the electrostatically sensitized segments



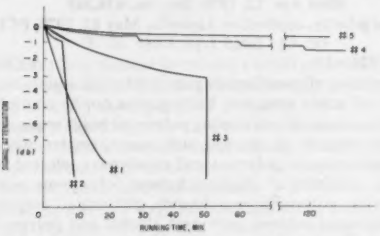
of the receptor sheets, and which, when activated by heat, solvent or solvent vapors, is a solvent for the dye components in the receptor sheet, and the remainder of the developer composition consists of a carrier for the finely divided compound, in which the developer compound is present in an amount within the range of 2–100% by weight when in the form of a dry powdered developer composition and 0.2–20% by weight when the developer composition is liquid.

4,115,290

MAGNETIC RECORDING MEDIUM

Yuichi Kubota, and Norifumi Kajimoto, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 790,914
Int. Cl.[2] H01F *1/00*; B23B *15/00*
U.S. Cl. 252—62.54 **12 Claims**



1. A magnetic recording medium which comprises: a magnetic coating on a substrate, said magnetic coating comprising a magnetic powder in a binder of nitrocellulose in which the isopropyl alcohol originally present has been replaced by a resin selected from the group consisting of polyurethane resins, polybutadiene resins, butadiene-acrylonitrile copolymers, vinyl chloride-vinyl acetate-vinyl alcohol copolymers, vinyl chloride-vinyl acetate copolymers, vinyl chloride-vinylidene chloride copolymers, vinylidene chloride-acrylonitrile copolymers, vinyl acetate resins, epoxy resins, phenoxy resins, polyvinylbutyral resins, polyvinyl formal resins and polyester resins, and which is cross-linked by reactive isocyanate groups in a polyurethane material blended with said alcohol free nitrocellulose binder.

4,115,291

LIQUID COMPOSITIONS BASED ON POLYGLYCOLETHERS HAVING A HIGH BOILING POINT

Sergio Gritti, Genthod-Geneve, Switzerland, assignor to Montedison S.p.A., Milan, Italy

Division of Ser. No. 167,035, Jul. 28, 1971, Pat. No. 3,991,122. This application Feb. 28, 1974, Ser. No. 446,790
Claims priority, application Italy, Jul. 31, 1970, 28130 A/70
Int. Cl.[2] C10M *3/16, 3/14*
U.S. Cl. 252—73 **7 Claims**

1. A process for the preparation of monoalkylethers of polyoxyalkyleneglycols, having a maximum viscosity of 1800 cSt at −40° c, an average molecular weight between 270 and 300, and a boiling point of from 290° to 310° C, wherein a mixture of ethylene oxide and propylene oxide in a weight ratio between 30:70 and 45:55 is reacted at 120°–150° C and under a pressure of from 3 to 10 atmospheres, and in an anhydrous alkaline medium catalyst, with a monoalkylether of diethylene glycol containing ethylene glycol, in a weight ratio: alkylene oxide/glycol-ether between 1.5 and 1.8 and thereafter diluting the product of the polyaddition with an alkoxy-triglycol, the alkoxy group of which has 1–4 carbon atoms, until the desired viscosity is obtained.

4. A liquid composition suited for use as an hydraulic brake fluid, having a boiling point between 290° and 310° C., a maximum viscosity of 1800 cSt. at −40° C., and consisting essentially of:

(a) 80–100% by weight of the monoalkylether of polyoxyalkylene glycol with an average molecular weight between 270 and 300 obtained by reacting a mixture of ethylene oxide and propylene oxide in a weight ratio between 30:70 and 45:55, with a monoalkylether of diethylene glycol, in a weight ratio of alkylene oxides/glycol ether between 1.2 and 1.8 in the presence of an alkaline catalyst, at 120°–150° C. under a pressure of from 3 to 10 atmospheres, and

(b) 0–20% by weight of an alkoxy-triglycol, the alkoxy group having from 1 – 4 carbon atoms.

4,115,292

ENZYME-CONTAINING DETERGENT ARTICLES

David L. Richardson, Forest Park, and Frank J. Mueller, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 20, 1977, Ser. No. 789,325
Int. Cl.[2] C11D *17/04*
U.S. Cl. 252—90 **34 Claims**

1. A unit dosage amount of a detergent composition, contained within an outer water-soluble film packet, comprising:

(a) at least about 0.5% by weight of a surface-active agent; and

(b) an effective amount of an enzyme enclosed within an inner water-soluble film having one dimension at least about 5 millimeters in size and a thickness of not more than about 50 mils.

4,115,293

DENTURE CLEANSER

Daniel Schoenholz, Basking Ridge, N.J., and Martin M. Perl, Brooklyn, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 620,102, Oct. 6, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,576
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 252—102 **12 Claims**

1. A thermogenic denture cleansing composition in powder or granular form comprising

(a) 60 to 85 wt % of an approximately stoichiometric mixture of

(1) an oxidizing agent selected from the group consisting of alkali metal percarbonate, perborate, persulfate, perpyrophosphate and monopersulfate, and

(2) a reducing agent selected from alkali metal sulfite, thiosulfite or metabisulfite; thiourea; and ascorbic acid,

(b) 5 to 15 wt % of a bleaching agent selected from the group consisting of alkali metal monopersulfates, said 5 to 15 wt % of alkali metal monopersulfates being in addition to any alkali metal monopersulfate used as an oxidizing agent,

(c) 0.01% to 5.0 wt % of a wetting agent selected from alkali metal salts of long chain alkyl sulfates, alkali metal salts of alkyl benzene sulfonates and nonionic surfactants that are stable to oxidants at a pH of 7 to 10,

(d) 0.01% to 0.5 wt % of a sequestering agent selected from alkali metal salts of aminocarboxylic acids, and

(e) sufficient pH adjusting agent to give the composition, when in aqueous solution, a pH of 7–10.

4,115,294

BACTERICIDAL SOAP BAR

Charles Fearnley, Romiley; Glenda Helen Fordham, Glossop, and Frank Lee, Bolton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,805

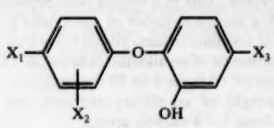
Claims priority, application United Kingdom, Jan. 10, 1976, 940/76; Feb. 24, 1976, 7153/76

Int. Cl.² C11D *9/50*

U.S. Cl. 252—106 **5 Claims**

1. A bactericidal soap bar consisting essentially of

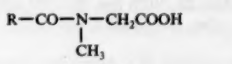
(a) 0.1 to 3 percent by weight, based on the total weight of the soap bar, of a bactericidal compound of the formula



(I)

wherein each of X_1 and X_3 independently represents a halogen atom which is the same or different and X_2 represents a hydrogen or halogen atom, and

(b) 0.1 to 10 percent by weight, based on the total weight of the soap bar, of a compound of the formula



(II)

wherein R represents an alkyl or alkenyl group of 8 to 17 carbon atoms.

4,115,295

POLYMERIZABLE COMPOSITIONS CONTAINING HIGHLY FLUORINATED ALIPHATIC SULFONYL PROTONIC ACID CATALYST

Janis Robins, St. Paul; James E. Kropp, Maplewood, and Chung I. Young, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 26, 1976, Ser. No. 679,940

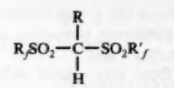
Int. Cl.² C08G *59/68*

U.S. Cl. 528—90 **24 Claims**

1. A manufacture comprising in separate containers:

(A) a first organic material having epoxide functionality greater than 1; and

(B) a second organic material having hydroxyl functionality of at least 1, wherein a catalyst of the formula:



where R_f and R_f' are independently a highly fluorinated or perfluorinated alkyl and R is selected from H, Br, Cl, I, alkyl having 1 to 20 carbon atoms, alkenyl having 3 to 4 carbon atoms, aryl and alkaryl radicals, or a compound capable of liberating such catalyst is contained therein in an amount of at least 0.01% by weight; whereby polymerization occurs upon mixture of A and B in amounts sufficient to provide a ratio of equivalents of hydroxyl-containing material to equivalents of epoxide in the range of about 0.3/1 to 1.5/1.

4,115,296

POLYHALOCARBOXYLIC ACID SALTS AS ACCELERATORS FOR CURING EPOXIDE RESINS

Christopher Michael Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,227

Claims priority, application United Kingdom, Dec. 30, 1975, 53103/75

Int. Cl.² C08G *59/40*

U.S. Cl. 528—92 **13 Claims**

1. A composition comprising

a. a curing agent for epoxide resins, which is a polyamine, a polyaminoamide, a polycarboxylic acid, or a polycarboxylic anhydride, and

b. a lithium, sodium, calcium, zinc, barium, copper, cobalt, nickel, manganese, vanadyl vanadium, chromic chromium, or magnesium salt of an aliphatic or araliphatic monocarboxylic acid of 2 to 8 carbon atoms, bearing on the carbon atom adjacent to the carboxyl group at least two halogen atoms chosen from fluorine and chlorine atoms.

4,115,297

THERMALLY REGENERABLE AMPHOTERIC ION EXCHANGERS PREPARED BY SEQUENTIAL TREATMENT OF POLYMERIC BEADS WITH TWO REAGENTS OF OPPOSING ACID BASE CHARACTER

Brian Alfred Bolto, Mitcham, and Kurt Hermann Eppinger, East Bentleigh, both of Australia, assignors to ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization, both of, Australia

Filed Apr. 12, 1976, Ser. No. 676,345

Claims priority, application Australia, May 12, 1975, PC1560

Int. Cl.² B01J *1/08;* C08F *28/00*

U.S. Cl. 521—32 **6 Claims**

1. A process of manufacturing an amphoteric resin wherein the ratio of acidic groups to basic groups can be controlled, which process comprises treating polymeric beads sequentially with two reagents of opposing acid base character, wherein said beads comprise polymers and copolymers selected from the group consisting of chloromethylated polystyrene, polyvinyl chloride, polyvinylidene chloride, chlorinated polyethylene, chlorinated rubbers, polyvinyl alcohol and polysaccharides, and wherein said reagents are reactable with said beads and are selected from the group consisting of thioglycolic, acid, thiolactic acid, thiomalic acid, thiosalicylic acid, and their analogous hydroxy acids, chloroacetic acid, 2-chloropropionic acid, 3-chlorobutyric acid, and their analogous bromo acids, and primary and secondary amines of the alkyl and aralkyl type, polyamines and derivatives thereof in which one amino group is in the primary and secondary form, with the others in primary, secondary or tertiary form, analogous cyclic diamines, 2-aminoethanethiol, 2-alkylaminoethanethiol, 2-dialkylaminoethanethiol, 2-aminoethylchloride, 2-alkylaminoethyl chloride, 2-dialkylaminoethyl chlorides, and α-ω-amino acids.

4,115,298

PROCESS FOR SPLITTING UP POLYURETHANE WASTE INTO ACTIVATED POLYHYDROXYL COMPOUNDS

Gottfried Schneider; Kuno Wagner, both of Leverkusen, and Heinz Wolfgang Patzelt, Memmingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 16, 1976, Ser. No. 723,872

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1975, 2542022

Int. Cl.² C08G *18/82, 18/32*

U.S. Cl. 260—2.3 **13 Claims**

1. A process for splitting up cellular and non-cellular polyurethanes into liquid reusable polyhydroxyl compounds for an isocyanate polyaddition process comprising reacting the polyurethanes at 150 ° to 250° C., with lactam melts or equilibrium

associates of lactams and water or organic materials containing at least two Zerewitinoff-active hydrogen atoms.

4,115,299

FROTHING METHOD AND AN APPARATUS FOR CARRYING OUT THE METHOD

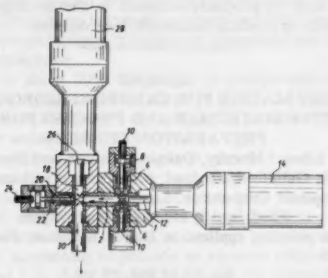
Dietrich Mühle, Kressbronn, Fed. Rep. of Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 4, 1976, Ser. No. 663,865

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513492

Int. Cl.² C08J *9/06*

U.S. Cl. 521—170 **12 Claims**



1. In a frothing method for mixing a liquid propellant having a low boiling point with further components for production of foamed material, the steps which comprise

separately injecting said further components under high pressure into a first cylindrical mixing chamber closed at one end and open at the other, to produce a first-stage, reactive mix in said first chamber;

advancing said first-stage mix through the open end of said first chamber to a second cylindrical mixing chamber, larger than the first and intersected by the first at the open end of the latter, said second chamber being closed at an axial end adjacent said intersection but open at its opposite axial end;

introducing said liquidified propellant into said first-stage mix through a port in said second chamber at said intersection of said chambers, whereby to provide a second-stage mix in said second chamber; and

then discharging said second-stage mix from said open end of said second chamber to allow said mix to expand and form said foamed material.

4,115,300

STABILIZED POLYOL COMPOSITIONS AND POLYURETHANE FOAMS

Dimitri A. Chakirof, San Pedro, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 25, 1977, Ser. No. 800,216

Int. Cl.² C08G *41/00*; C09K *3/28*

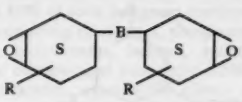
U.S. Cl. 521—171 **10 Claims**

1. A stabilized polyol blend comprising,

(i) a halogenated polyol;

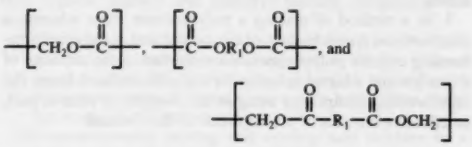
(ii) a tertiary amine urethane catalyst; and

(iii) a stabilizing amount of a diepoxide selected from the group consisting of

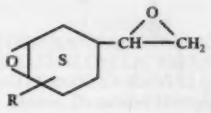


(a)

wherein R in each ring is independently selected from the group consisting of hydrogen and alkyl from 1 to 8 carbon atoms and B represents a divalent radical selected from the group consisting of

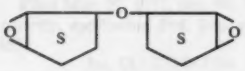


wherein R_1 is alkylene from 1 to 8 carbon atoms;



(b)

wherein R is defined as above; and



(c)

4,115,301

CROSS-LINKER FOR FLEXIBLE AND SEMI-FLEXIBLE POLYURETHANE FOAMS

William Alvis Kennedy, Houston, Tex., assignor to Texaco Development Corp., New York, N.Y.

Division of Ser. No. 546,460, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 398,179, Sep. 17, 1973, abandoned. This application Jan. 6, 1977, Ser. No. 757,254

Int. Cl.² C08G *18/32*; C08J *9/06*

U.S. Cl. 521—155 **5 Claims**

1. A polyurethane foam composition consisting essentially of:

a polyether polyol which has been reacted with an organic polyisocyanate in the presence of blowing agent and from about 0.8 parts to about 2.5 parts by weight per 100 parts by weight of said polyether polyol of a polymethylene polyphenyl amine mixture having an average functionality of from about 2.2 to about 2.9 wherein the methylene dianiline portion of said amine mixture has an isomeric distribution of from about 10 to 70 weight percent 2,4'-isomer, from about 1 to 20 weight percent 2,2'-isomer, with the remaining methylene dianiline being the 4,4'-isomer.

4,115,302

SUBSTITUTED MORPHOLINE CATALYST FOR POLYURETHANE FOAM

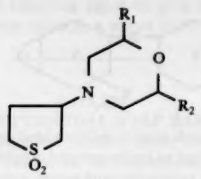
Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,328

Int. Cl.² C07D *295/00*; C08G *18/16*

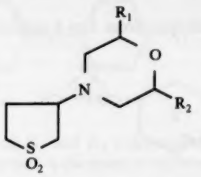
U.S. Cl. 521—115 **4 Claims**

1. A compound of the formula



wherein R_1 and R_2 are alkyl radicals having 1 to 4 carbon atoms.

3. In a method of making a polyurethane foam wherein a polyurethane-forming long chain polyol and a polyurethane-forming organic polyisocyanate are reacted in the presence of a catalyst and a blowing agent for the polyurethane foam, the improvement comprising using as the catalyst, at least in part, an effective amount of a compound of the formula



wherein R_1 and R_2 are alkyl radicals having 1 to 4 carbon atoms.

4,115,303

METHOD OF FABRICATION OF POROUS MACROMOLECULAR MATERIALS HAVING AN INTERNAL LINING AND MATERIALS OBTAINED BY MEANS OF SAID METHOD

Joseph Marchand, Choisy-le-Roi, and Jean-René Puig, Sevres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 349,490, Apr. 9, 1976, abandoned. This application May 24, 1976, Ser. No. 689,207

Claims priority, application France, Apr. 21, 1972, 7214293

Int. Cl.[2] C08J *9/00*; C08F *2/46*

U.S. Cl. 521—53 **17 Claims**

1. A method for producing porous macromolecular material from a polymer consisting of a polyolefin, comprising

irradiating the polyolefin with heavy nuclear particles, whereby the polyolefin is modified in the region along the path of the nuclear particles to make it more reactive to attack in the region along the path by a chemical attacking agent selected from the group consisting of strong oxidizers and strong bases, and additionally to make it more reactive towards monomers having at least one ethylene double bond;

reacting said modified polyolefin with said chemical attacking agent, whereby a portion of the modified polyolefin is removed forming a pore structure in and through said polyolefin; and

reacting the polyolefin at the modified portion, with a monomer having at least one ethylene double bond, whereby the monomer is fixed to at least a portion of the modified polyolefin.

4,115,304

HYDROXYL CONTAINING MATERIALS FROM DISTILLATION RESIDUE OBTAINED BY DISTILLING HEXAMETHYLENE DIAMINE FROM A MIXTURE THEREOF WITH BY-PRODUCTS OBTAINED IN THE HYDROGENATION OF ADIPONITRILE TO PRODUCE HEXAMETHYLENE DIAMINE

David H. Chadwick, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 14, 1977, Ser. No. 833,114

Int. Cl.[2] C08J *9/00*; C08G *63/12, 18/02*; C07C *93/04*

U.S. Cl. 521—167 **17 Claims**

11. In a process for the production of a polyurethane resin by reacting an organic polyisocyanate, an organic hydroxyl group containing material, a chain extender, and optionally catalysts and blowing agents, the improvements wherein said chain extender comprises a hydroxyl containing composition comprising the alkoxylated product of a distillation residue obtained by distilling hexamethylene diamine from a mixture thereof with by-products obtained in the hydrogenation of adiponitrile to produce hexamethylene diamine.

4,115,305

SUPPORT MATRIX FOR CARRYING BIOLOGICALLY ACTIVE MATERIALS AND PROCESS FOR THE PREPARATION THEREOF

William Edward Hornby, Dairsie, Scotland, and David Lindsey Morris, Guildford, England, assignors to National Research Development Corporation, London, England

Filed Jun. 2, 1976, Ser. No. 692,036

Claims priority, application United Kingdom, Jun. 4, 1975, 24125/75

Int. Cl.[2] C08L *89/00*

U.S. Cl. 260—6 **25 Claims**

1. A biologically active matrix comprising a support and a biologically active material which is bound thereto, said support comprising an organic polymer incorporating amidine groups the carbon atoms of which are bound to side chains each of which includes a functional group capable of linkage to the biologically active material, and a carbonyl group or an enol form thereof which is spaced from the carbon atom of an amidine group by the backbone dependent nitrogen atom thereof and at most by one other nitrogen atom in the side chain.

4,115,306

VINYL ESTER AQUEOUS ADHESIVE EMULSIONS INCLUDING ALLYL CARBAMATE

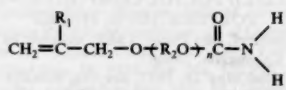
Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Nov. 25, 1977, Ser. No. 853,993

Int. Cl.[2] C09J *3/12*

U.S. Cl. 260—17 A **10 Claims**

1. An aqueous adhesive emulsion which develops water resistance through cure, the water of said emulsion having emulsified therein an aqueous emulsion copolymer of monoethylenic monomers, at least 40 up to 99.5% of the copolymer being vinyl ester of a saturated aliphatic monocarboxylic acid having up to 18 carbon atoms and from 0.5–15% by weight of the copolymer of an allyl carbamate being the formula:



in which R_1 is hydrogen or methyl, and R_2 is an alkylidene group containing from 2–4 carbon atoms, and n is an integer from 0–10, any balance of said copolymer consisting essentially of monoethylenic monomers copolymerizable with said vinyl ester and nonreactive with hydroxy during emulsion copolymerization, the monomers of said copolymer being emulsified

during copolymerization by from 0.5 to 10% of an hydroxy functional protective colloid selected from the group consisting of polyvinyl alcohol and hydroxy ethyl cellulose and said adhesive emulsion being acidic to about neutral.

4,115,307
PHOSPHATE COMPOSITION

James D. McGilvery, Etobicoke, Canada, assignor to Erco Industries Limited, Islington, Canada

Continuation-in-part of Ser. No. 640,741, Dec. 15, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,197

Claims priority, application United Kingdom, Dec. 13, 1974, 53900/74

Int. Cl.[2] A61K *7/50;* **C02B** *5/04;* **C11D** *7/14, 11/00*

U.S. Cl. 252—135 **13 Claims**

1. A dry, free-flowing, granular composition comprising granules formed from

about 45 to about 85% by weight of a hydratable alkali metal phosphate selected from the group consisting of sodium tripolyphosphate, tetrasodium pyrophosphate, tetrapotassium pyrophosphate, tripotassium phosphate and dipotassium phosphate;

about 9 to about 30% by weight of polyphosphoric acid having a P_2O_5 content of about 75 to about 85%;

about 1.5 to about 23% by weight of sodium carbonate and/or sodium bicarbonate; and

about 4 to about 17% by weight of water,

said granules having a bulk density of about 0.5 to about 0.8 g/cc and an oil absorbency of about 50 to about 80%;

said alkali metal phosphate, said polyphosphoric acid and said sodium carbonate and/or sodium bicarbonate being present in amounts to provide an aqueous solution of pH of about 7 to about 8 upon dissolving the composition in water.

7. A method of forming a low density, dry, free-flowing, granular phosphate composition, which comprises:

forming a dry, free-flowing mixture of (1) a hydratable alkali metal phosphate selected from the group consisting of sodium tripolyphosphate, tetrasodium pyrophosphate, tetrapotassium pyrophosphate, tripotassium phosphate and dipotassium phosphate, (2) a polyphosphoric acid having a P_2O_5 content of about 75 to about 85%, and (3) sodium carbonate and/or sodium bicarbonate, the relative quantities of said alkali metal phosphate, polyphosphoric acid and sodium carbonate and/or sodium bicarbonate being such that the mixture, if dissolved in water, would result in a solution having a pH of about 7 to 8, and

granulating said mixture with water to cause reaction between diluted polyphosphoric acid and part of said sodium carbonate and/or sodium bicarbonate to evolve carbon dioxide and form an expanded dry, free-flowing, granular phosphate composition having a bulk density of about 0.5 to about 0.8 g/cc and an oil absorbency in the range of about 50 to about 80%,

the overall quantities of the components of the composition being:

about 45 to about 85% by weight of said hydratable alkali metal phosphate,

about 9 to about 30% by weight of said polyphosphoric acid,

about 1.5 to about 23% by weight of said sodium carbonate and/or sodium bicarbonate, and

about 4 to about 17% by weight of water.

4,115,308
HIGH-SHEAR PROCESS FOR PREPARING SILICATE-CONTAINING PASTE-FORM DETERGENT COMPOSITIONS

Raymond Ellwood Guerry, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 27, 1976, Ser. No. 754,656

Int. Cl.[2] C11D *11/00, 3/08, 13/10, 17/00*

U.S. Cl. 252—135 **11 Claims**

1. A process for the production of alkaline, silicate-containing, paste-form detergent compositions, comprising from about 30 to about 80% of solid inorganic components selected from the group consisting of silicates, phosphates, polyphosphates, carbonates, bicarbonates, borates, sulfates, and mixtures thereof; and containing at least about 0.5% of an alkoxylated nonionic surfactant, wherein the alkoxy moiety is selected from the group consisting of ethylene oxide, propylene oxide, and mixtures thereof; wherein the amount of water-soluble alkali metal silicate in the final composition is from about 10 to about 40%; and wherein the final composition contains from about 10 to about 50% of a detergency builder selected from the group consisting of polyphosphates, carbonates, bicarbonates, organic builders and mixtures thereof; comprising the steps of:

(a) high-shear mixing the solid and liquid components of said composition, such that the temperature of the mixture exceeds about 80° F; the ratio by weight, of said solid components to said liquid components being from about 4:1 to about 1:2; followed by

(b) simultaneously mixing and cooling said mixture to a temperature of less than about 80° F when a temperature of about 120° F is exceeded in step (a).

4,115,309
COMPOSITIONS AND METHOD FOR ACTIVATING OXYGEN UTILIZING CYCLIC ESTER-ANHYDRIDES OF α-HYDROXYCARBOXYLIC ACIDS

Horst-Jürgen Krause, Dusseldorf-Holthausen; Christian Hase, Erkrath-Unterbach, and Helmut Bloching, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

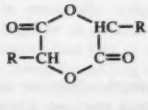
Filed Mar. 29, 1977, Ser. No. 782,335

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614521

Int. Cl.[2] C11D *7/54*

U.S. Cl. 252—186 **16 Claims**

1. The method of activating aqueous solutions of percompounds selected from the group consisting of hydrogen peroxide and water-soluble inorganic peroxyhydrates containing from 20 mg to 500 mg per liter of active oxygen, said solution having a pH of 4 to 12 and a temperature of from 10° to 70° C which consists essentially of adding to said aqueous solution at least one hexacyclic ester-anhydride having the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having 1 to 18 carbon atoms and $-(CH_2)_n-(-CHOH)_m-COOY$, where n is an integer from 1 to 3, m is an integer from 0 to 1 and Y is a member selected from the group consisting of hydrogen, alkali metal, ammonium, lower alkanolammonium, and N-lower-alkyl-piperidinium, as an activator, in an amount sufficient to activate said percompound.

4,115,310
LIQUID CRYSTALLINE COMPOSITION

Hisato Sato, Tokyo; Masayuki Tazume, Urawa; Takasi Yamaki, Tokyo; Yutaka Fujita, Yokohama, and Yoshi Arai, Oyama, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo and Kawamura Institute of Chemical Research, both of Japan

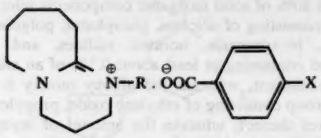
Filed Oct. 13, 1976, Ser. No. 731,645

Claims priority, application Japan, Oct. 15, 1975, 50-124199

Int. Cl.[2] C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **8 Claims**

1. A liquid crystalline composition comprising a nematic liquid crystalline substance having negative dielectric anisotropy and as an additive, at least one compound of the general formula



wherein X is an amino group, a nitro group, a chlorine atom, a hydrogen atom, or a straight-chain alkyl group containing 1 to 6 carbon atoms, and R is a straight-chain alkyl group containing 10 to 20 carbon atoms with the proviso that when X is a hydrogen atom or a straight-chain alkyl group containing 1 to 6 carbon atoms, R is a straight-chain alkyl group containing 14 to 20 carbon atoms,

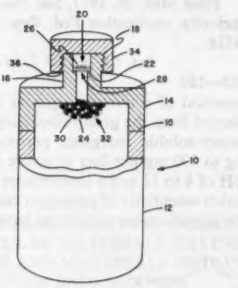
and said additive being used in the range of 0.05 to 0.5% by weight of the nematic liquid crystalline substance.

4,115,311

NUCLEAR WASTE STORAGE CONTAINER WITH METAL MATRIX

Kenneth R. Sump, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,383
Int. Cl.[2] G21F *9/34*
U.S. Cl. 252—301.1 W **8 Claims**



1. A method of encapsulating a high-level radioactive waste within a metal powder matrix in a storage container having a maximum length of about 15 ft. and maximum inner diameter of about 2 ft. wherein said matrix is not formed by molten metal, consisting essentially of disposing high-level radioactive waste particles within said storage container, said high-level waste particles having a diameter of from about 0.5 to about 25 mm, interspersing a metal powder having a particle size of from about 0.05 to 2.0 mm into said waste to permeate between and around said high-level waste particles, disposing a cover member on said storage chamber to close and seal said storage chamber, and heating said storage chamber containing said metal matrix powder and said high-level waste particulate material to a sintering temperature for a sufficient length of time to sinter said metal powder and effect a metal powder matrix about said high-level waste particles, said high-level waste particles occupying from about 50 to about 70 volume percent of said storage container and said metal powder matrix occupying from about 35 to about 65 volume percent of theoretical of the remaining volume of said storage container, said metal powder matrix providing impact strength to said storage container and increasing heat transfer from said storage container interior to said storage container exterior to prevent undesirably high center line temperatures.

4,115,312

X-RAY FLUORESCENT LUMINESCENT CADMIUM TUNGSTATE COMPOSITIONS

Gerhard Engel, and Manfred Eckle, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,204
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621696
Int. Cl.[2] C09K *11/38, 11/10*
U.S. Cl. 252—301.5 **8 Claims**

1. In a process for producing x-ray fluorescent luminescent cadmium tungstate material by precipitation of cadmium tungstate from an aqueous solution of an alkali metal tungstate by the addition of an aqueous solution of a cadmium salt and separation, washing, drying and calcining of the resulting precipitate, the improvement wherein

(a) each of the alkali metal tungstate and cadmium salt solutions is at least 1N,

(b) mixing of the two solutions is done over 0.1 to 4 hours,

(c) approximately equivalent amounts of both solutions are mixed,

(d) mixing is done at a temperature of 0° C the boiling point of the mixture

(e) the precipitate is activated by calcination at a temperature between 400° and 1200° C. for up to 6 hours, and

(f) the thus-activated precipitate is reslurried in water, washed and dried.

4,115,313

BILE ACID EMULSIONS

Irving Lyon, and Harriette Lyon, both of 415 N. Orange Grove Ave., Apt. 10, Los Angeles, Calif. 90036

Continuation-in-part of Ser. No. 513,069, Oct. 8, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,225
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—309 **9 Claims**

1. An emulsion composition consisting essentially of:

(1) bile acid member selected from the class consisting of bile acids, bile acid conjugates, lower alcohol esters of bile acids or bile acid conjugates, salts of bile acids or bile acid conjugates, and mixtures thereof;

(2) water to effect solution of said bile acid member; and

(3) at least one component selected from the class consisting of:

(a) glycerides of fatty acids having about 12–22 carbon atoms;

(b) phospholipids selected from the group consisting of (i) glycerol esters containing alpha or beta phosphoric acid and (ii) a hydroxy-containing compound combined in an ester link with a phosphate group;

(c) fatty acids, amino fatty acids, or fatty acid amides, where said fatty acids have about 12–22 carbon atoms and said amino fatty acids and said fatty acid amides are derivable from fatty acids having about 12–22 carbon atoms; and

(d) steroids selected from the group consisting of (i) animal sterols and (ii) vegetable sterols, where said bile acid member and each of said (a), (b), (c) and (d) units of said component (3), when present, is present in said emulsion composition in an amount between about 10 and 250 millimoles per liter of said bile acid member-water solution, and where the molar proportion of each of said components *3a*, *3b*, *3c* and *3d*, when present, lies in the range of about 0.3–3 moles per mole of said component (1) present.

4,115,314
PRODUCTION OF WATER-IN-OIL EMULSIONS

Knut Oppenläender, Ludwigshafen; Karl Seib, Weinheim, and Heinz Krapf, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Pflaz, Fed. Rep. of Germany

Division of Ser. No. 630,635, Nov. 10, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,582

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1974, 2455287; Aug. 16, 1975, 2536597

Int. Cl.² B01J *13/00*

U.S. Cl. 252—309 **3 Claims**

1. In a process for the production of water-in-oil emulsions at a temperature of about 70° to 75° C wherein water is added to an oily or fatty phase containing an emulsifier in small portions, said added water having a temperature of about 2° C higher than the temperature of said oily or fatty phase, the improvement which comprises using as the emulsifier a reaction product obtained by the following steps:

(a) reacting saturated or unsaturated fatty alcohols of 16 to 20 carbon atoms, which alcohols are selected from the group consisting of oleyl alcohol, stearyl alcohol, myristyl alcohol, linolenyl alcohol, tallow fat alcohol, ALFOLS of 16 to 18 carbon atoms, oxo alcohols of 17 to 19 carbon atoms and mixtures thereof, with epichlorohydrin in the presence of an acid catalyst, and eliminating hydrogen chloride from the chlorohydrin by means of solid powdered alkali metal hydroxide, the molar ratio of alcohol to epichlorohydrin being from 1:0.5 to 1:1.5; and

(b) reacting the glycidyl ethers produced in step (a) with polyhydric alcohols of 2 to 6 carbon atoms and containing from 2 to 6 hydroxyl groups, said polyhydric alcohols being selected from the group consisting of ethylene glycol, dipropylene glycol, 1,4-butanediol, 1,2,4-butanetriol, glycerol, trimethylolpropane sorbitol, neopentyl glycol, and pentaerythritol, or with monoethers of said alcohols with fatty alcohols of 10 to 22 carbon atoms per fatty alcohol radicals, in a molar ratio of glycidyl ether to polyhydric alcohol or ether of from 1:1.5 to 1:6.0, the reaction of the glycidyl ether with the polyhydric alcohol or ether being carried out in the presence of Lewis acids selected from the group consisting of boron fluoride etherate, boron fluoride/phosphoric acid, boron fluoride/acetic acid, boron fluoride hydrate, boron fluoride alkylglycol etherate, tin tetrachloride, zinc chloride, titanium tetrachloride and aluminum chloride and sulfuric acid or in the presence of alkaline catalysts selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, the corresponding oxides, carbonates, alcoholates of 1 to 4 carbon atoms per alcohol radical, tertiary amines and the corresponding quaternary ammonium hydroxides.

4,115,315
PEARLESCENT CAPSULES AND PROCESS FOR THEIR PREPARATION

Nicola Marinelli, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 16, 1977, Ser. No. 769,296

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **9 Claims**

1. A process for preparing oil-containing pearlescent capsules, en masse, in an aqueous manufacturing vehicle, comprising the steps of:

(a) providing a dispersion of inorganic pearlescent particles comprising mica coated with titanium dioxide in an oily intended capsule core material substantially insoluble in the aqueous manufacturing vehicle,

(b) adding said dispersion to an agitating aqueous manufacturing vehicle system capable of coacervation and comprising water and at least one film-forming hydrophilic colloid material, whereby said pearlescent particles flush out into the aqueous coacervation phase, and

(c) causing coacervation of said system, whereby the film-forming hydrophilic colloid material deposits and enwraps droplets of the oily capsule core material to form said oil-containing capsules, said pearlescent particles being embedded in and becoming an integral part of the resultant capsular wall material.

9. Oil-containing pearlescent capsules produced in accordance with the process of claim 1.

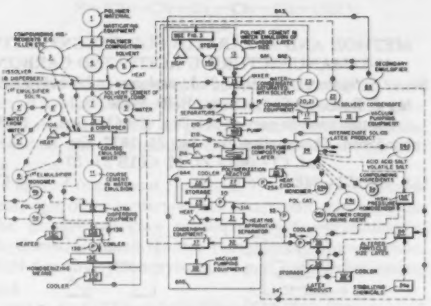
4,115,316
EMULSIFYING AND SEPARATING LATEX AND SOLVENT

Oliver W. Burke, Jr., Fort Lauderdale, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 484,340, Jun. 28, 1974, Pat. No. 3,968,067, which is a continuation-in-part of Ser. No. 226,419, Feb. 15, 1972, which is a continuation-in-part of Ser. No. 817,494, Apr. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 621,997, Mar. 7, 1967, Pat. No. 3,503,917. This application Jun. 28, 1976, Ser. No. 700,295

Int. Cl.² B01J *13/00*

U.S. Cl. 252—359 A **3 Claims**



1. An improved apparatus for the formation of a latex from an organic solvent dispersion of a composition of an organic solvent soluble or dispersible, water insoluble, macromolecular substance, said apparatus being of the type which comprises:

(1) means for providing a dispersion of the said composition in essentially water-immiscible volatile solvent which itself or as an azeotrope with water has a boiling point lower than that of water at atmospheric pressure,

(2) means for adding water and emulsifier to said dispersion in proportions to form an emulsion having water as its continuum and emulsifying the same so that the discontinuous phase thereof is in particles at least principally of precursor latex particle size,

(3) a separating means for stripping the solvent from the emulsion to form a latex, and

(4) means for separately delivering latex and vapors from said separating means,

and wherein

(5) said separating means comprises

(a) conduit means for providing a moving flow of gas comprising steam as an initial continuous phase,

(b) vaporizing means for dispersing the said emulsion into said flow of gas comprising steam as the initial continuous phase for vaporizing solvent from the dispersed droplets and forming a flow of latex droplet and vapors therein,

(c) means for establishing a separating zone and for maintaining the same at a lower pressure than that in said vaporizing means, and means connected to said separating zone for establishing a flow of latex and water vapor into said separating zone,

(d) means connecting said vaporizing means and said separating zone for introducing into said separating zone the latex droplets and vapor produced in said

vaporizing means and impinging said droplets upon the flow of latex therein,

(e) a conduit leading from said separating zone for withdrawing vapors from said separating zone, and

(f) a conduit leading from said separating zone for withdrawing latex from said separating zone.

the improvement comprising, in combination in the apparatus:

(6) means connected to said conduit (*e*) for cooling and condensing the vapors withdrawn therethrough to form a mixture of said solvent in liquid form and water containing some solvent,

(7) separator means connected to said condensing means for affecting separation of the liquid solvent from said solvent-containing water, and

(8) an indirect contact heat exchanger connected for receiving from said separator means, and vaporizing, a quantity of said solvent-containing water sufficient to form at least a substantial part of said flow of gas comprising steam, and connected to said conduit member (*a*) to deliver the vaporized solvent-containing water thereto to provide the flow of gas in said conduit (*a*) at least in part.

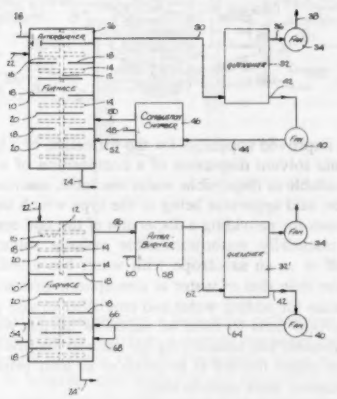
4,115,317
METHOD AND APPARATUS FOR REGENERATING AND MANUFACTURING ACTIVATED CARBON

Stuart S. Spater, Livingston, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Continuation-in-part of Ser. No. 609,630, Sep. 2, 1975, abandoned. This application Mar. 31, 1977, Ser. No. 783,381

Int. Cl.[2] B01J *21/18*; C01B *31/10*

U.S. Cl. 252—418 **8 Claims**



1. In a system for regenerating or manufacturing activated carbon, having a multiple hearth furnace and gas cooling means, a method comprising, in combination, the steps of introducing into the upper portion of said furnace granular activated carbon having a carbon content from about 45% to about 95%, progressively passing said granular activated carbon material downwardly through said furnace over said hearths and through a series of vertically disposed burning zones for burning undesired material therefrom, discharging the finished product from a lower portion of said furnace, passing the exhaust gases and vapors from an upper portion of said furnace through an auxiliary burning zone to complete the combustion process, conducting said exhaust gases and vapors from said auxiliary burning zone to said cooling means for adiabatic cooling of same to saturation, withdrawing clean gases from said cooling means, withdrawing a slip stream of water saturated gases from said cooling means conducting them to a lower hearth portion of said furnace, thereby providing a method of recycling gases wherein the water vapor from said gas cooling means is substantially the sole source of water vapor used for reaction with the carbon in the furnace.

2. A method of regenerating or manufacturing activated carbon according to claim 1, further comprising the steps of firing said furnace by an external combustion chamber, and wherein said step of withdrawing a slip stream of water saturated gases from said cooling means and conducting them to a lower hearth portion of said furnace includes the steps of conducting said gases to said combustion chamber and then passing a mixture of the gaseous products of fuel combustion and said slip stream of water saturated gases into the lower hearth portion of said furnace.

5. A method of regenerating or manufacturing activated carbon according to claim 1, wherein said regenerating or manufacturing system includes an afterburner mounted on the top of said furnace, and said exhaust gases and vapors from the upper portion of said furnace are first passed to said afterburner prior to being passed to said cooling means.

6. A method of regenerating or manufacturing activated carbon according to claim 1, wherein an external afterburner is disposed between said furnace and said cooling means and said method comprises the steps of passing the exhaust gases and vapors from said furnace to said afterburner, and completing the combustion process of said gases in said afterburner, and passing the exhaust gases and vapors from said afterburner to said cooling means.

4,115,318
OLEFIN POLYMERIZATION CATALYST

Anthony N. Speca, Cincinnati, Ohio, assignor to National Petro Chemicals Corporation, New York, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,191

Int. Cl.[2] C08F *4/78*

U.S. Cl. 252—428 **16 Claims**

1. A process for the preparation of an olefin polymerization catalyst which comprises:

(a) depositing at least one polymeric chromium (III) compound upon an inorganic support material, said polymeric chromium (III) compound being at least one member of the group consisting of a poly(di-μ-dihydrocarbylphosphinatohydroxyaquochromium (III)) compound and the corresponding anhydrous compound, said polymeric chromium (III) compound containing from 2 to about 350 monomeric units; and

(b) heating said support material having the polymeric chromium (III) compound deposited thereon in a non-reducing atmosphere above 300° C. up to the decomposition temperature of the support material.

4,115,319
CATALYSTS AND CATALYST COMPONENTS FOR POLYMERIZING OLEFINS

Umberto Scatá; Luciano Luciani, and Pier Camillo Barbé, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 17, 1976, Ser. No. 724,361

Claims priority, application Italy, Sep. 19, 1975, 27438 A/75

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **11 Claims**

1. Solid catalyst-forming components for use in preparing a catalyst for polymerizing ethylene and/or alphaolefins, comprising compounds containing Ti, Mg and halogens, in which the halogen/Mg atomic ratio is at least 1, said component being prepared by reacting a tetravalent Ti compound selected from the group consisting of Ti tetrahalides, Ti tetraalcoholates, Ti haloalcoholates, and Ti tetraamides, with the solid halogenation product containing halogen atoms bonded to Mg atoms obtained by reaction of a halogenating agent, different from the halogenated Ti compounds, with a Mg compound selected from the group consisting of

(a) organic oxygenated Mg compounds of the formula

XMgOR

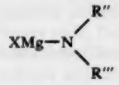
in which R is an alkyl, aryl, cycloalkyl or acyl radical containing from 1 to 20 carbon atoms or —OR forms an enolate radical containing from 1 to 20 carbon atoms, and X is OR, halogen, $(SO_4)_{\frac{1}{2}}$, — OH, $(CO_3)_{\frac{1}{2}}$, $(PO_4)_{\frac{1}{3}}$, carboxylate or an alkyl, aryl, or cycloalkyl radical containing from 1 to 20 carbon atoms

(b) organometallic compounds of the formula

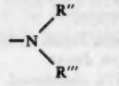
YMgR'

in which R' is an alkyl, aryl, or cycloalkyl radical containing from 1 to 20 carbon atoms, and Y is halogen or R'; and

(c) Mg organic compounds of the formula



in which R'' and R''' are hydrogen or alkyl or aryl radicals containing from 1 to 20 carbon atoms; and X is



or has the same significance as in (a); said catalyst component being further characterized in that it contains an electron-donor in a quantity greater than 0.1 but not greater than 1.0 mole per g-atom of Mg.

4,115,320
CATALYSTS FOR ISOCYANATE POLYADDITION REACTIONS

Holger Meyborg, Odenthal-Gloebusch, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 7, 1977, Ser. No. 757,720

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601082

Int. Cl.[2] B01J *31/12;* **C08G** *18/00*

U.S. Cl. 252—431 C **5 Claims**

1. Catalyst combinations comprising:

(A) 1 mol of a metal compound corresponding to the following formula:

$$Me\ X_n Y_m$$

wherein

Me represents a metal having a valency of $(n+m)$,

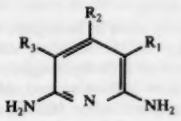
X represents an aliphatic hydrocarbon group having from 1 to 18 carbon atoms, an aromatic hydrocarbon group having from 6 to 10 carbon atoms, or an araliphatic hydrocarbon group having from 7 to 15 carbon atoms,

Y represents an enolate group having from 5 to 18 carbon atoms or an aliphatic carboxylate group having from 2 to 18 carbon atoms,

n represents an integer of from 0 to 2 and

m represents an integer of from 0 to 4 such that the sum of $(n + m)$ is from 2 to 4, and

(B) from about 0.5 to about 5 mols of a primary amine corresponding to the following general formula:



wherein

R_1, R_2, and R_3, which may be the same or different, each represent a hydrogen atom, an aliphatic hydrocarbon group having from 1 to 6 carbon atoms, an aromatic group having from 6 to 12 carbon atoms, or two of the groups R_1 to R_3 represent a condensed aromatic ring.

4,115,321
CATALYST SYSTEMS CONTAINING N,N-DIMETHYLAMINOALKOXYPROPIONITRILES FOR POLYURETHANE FOAM FORMULATION

Michael Ray Sandner, Chappaqua, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

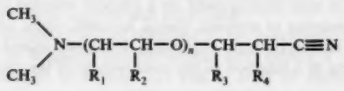
Division of Ser. No. 699,459, Jun. 24, 1976, Pat. No. 4,033,911. This application Apr. 4, 1977, Ser. No. 784,418

Int. Cl.[2] B01J *31/04, 31/02, 27/22;* **C08G** *18/14*

U.S. Cl. 252—431 C **11 Claims**

1. A catalyst combination for cellular urethane formation which comprises:

(1) a total of from about 5 to about 95 weight percent of at least one dimethylamino ether propionitrile having the formula:



wherein *n* has an average value of at least one and no more than about five, and each of R_1,R_2,R_3, and R_4 represents hydrogen, methyl or ethyl with the proviso that, R_1 and R_2 cumulatively and R_3 and R_4 cumulatively, have no more than two carbon atoms;

(2) a total of from about 5 to about 95 weight percent of at least one other tertiary-amine component selected from the group consisting of bis[2-(N,N-dimethylamino)]-ethyl]ether, 3-dimethylamino-N,N-dimethylpropionamide, N,N-dimethylcyclohexylamine, and triethylenediamine; and

(3) zero or up to 15 weight percent of an organic compound of tin; said weight percentages being based on the combined total weight on components (1), (2) and (3).

6. A catalyst blend for cellular urethane formation which comprises:

(1) a total of from about 10 to about 90 weight percent of 3-(2-dimethylaminoethoxy)propionitrile, 3-[2-(2-dimethylaminoethoxy)ethoxy]propionitrile or a combination thereof;

(2) a total of from about 10 to about 90 weight percent of at least one other tertiary-amine component selected from the group consisting of triethylenediamine, N,N,N',N'-tetramethylethylenediamine, N,N,N',N'-tetramethyl-1,3-butanediamine, bis[2-(N,N-dimethylamino)ethyl]ether, 1,1,4,7,7-pentamethyldiethylenetriamine,3-dimethylamino-N,N-dimethylpropionamide and N,N-dimethylcyclohexylamine; and

(3) zero or up to 10 weight percent of an organic compound of tin; said weight percentages being based on the combined total weight of components (1), (2) and (3) contained in the blend.

4,115,322
METHOD FOR OBTAINING HIGH ACTIVITY ELECTROCATALYSTS ON PYROLYTIC GRAPHITE

Ikram Morcos, Longueuil, Canada, assignor to Hydro-Quebec, Montreal, Canada

Continuation-in-part of Ser. No. 646,994, Jan. 7, 1976, abandoned. This application Jun. 8, 1977, Ser. No. 804,729

Int. Cl.[2] B01J *21/18, 23/40, 23/50, 23/52*

U.S. Cl. 252—447 **14 Claims**

1. A method of producing an electrochemical catalyst consisting of a thin film of a metal selected from the group consisting of Ni, noble metals, and alloys thereof, deposited onto a non-porous pyrolytic graphite support wherein the improve-

ment comprises electrolytically depositing said thin film of metal onto said non-porous pyrolytic graphite support in a simple electrochemical cell from an aqueous solution containing said Ni, noble metals, or alloys thereof in a complex salt form.

4,115,323

CATALYST AND PROCESS FOR PRODUCTION OF VCM

Michael F. Lemanski, Euclid; Frederick C. Leitert, North Madison, and Carl G. Vinson, Jr., Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 19, 1977, Ser. No. 843,721

Int. Cl.[2] B01J *23/80, 23/60*

U.S. Cl. 252—455 R **7 Claims**

1. A catalyst for production of VCM comprising from about 0.01 to about 6% by weight of a salt of a metal selected from the group consisting of rhodium and platinum, from about 0.01 to about 15% of a salt of a metal selected from the group consisting of iron and copper, and from about 1.0 to about 25% of a salt of zinc; impregnated on a support selected from the group consisting of alumina, titania, zirconia, silica, and silica alumina; said percentages expressing the metal content of each component as a function of the total weight of the catalyst.

4,115,324

CATALYST FOR TREATING HEAVY OILS

Hiromi Ozaki, Urawa; Mamoru Yamane, Kiyose; Yoshihito Satomi, Ageo; Teruo Suzuka, Kawaguchi; Toshinobu Miyake, Urawa, and Mizuho Hirato, Hitachi, all of Japan, assignors to Nippon Mining Co., Ltd and Hitachi, Ltd., both of Tokyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,355

Int. Cl.[2] B01J *29/10, 29/20, 23/40, 23/74*

U.S. Cl. 252—459 **4 Claims**

1. A catalyst applicable to the cracking treatments for heavy oils, which is obtained by grinding nickel-containing ore selected from the group consisting of garnierite and laterite, forming the ground ore through pelletization and baking the formed ore in an oxidizing atmosphere at a temperature in the range of about 850° C to above 1200° C.

4,115,325

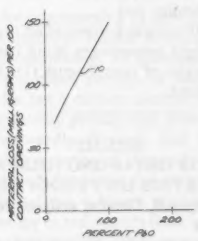
ELECTRICAL CONTACT MATERIAL

Teuvo J. Santala, and Hans G. Hirsbrunner, both of Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,700

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—514 **5 Claims**



1. An electrical contact material comprising from 85 to 87.5 percent silver, by weight and from 0.01 to 0.10 percent cobalt oxide, by weight, and from 10.73 to 12.82 percent cadmium oxide, from 1.6 to 2.0 percent zinc oxide and from 0.15 to 1.0 percent lead oxide by weight, internally oxidized in situ in the contact material in an oxygen enriched atmosphere.

4,115,326

PERFUMING OF COMPOSITION USING 3-(10-UNDECENYLOXY)PROPRIONITRILE

Marcel Plattier, Antibes, and Paul Jose Teisseire, Grasse, both of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

Filed Aug. 24, 1976, Ser. No. 717,281

Claims priority, application Switzerland, Sep. 4, 1975, 11436/75

Int. Cl.[2] C07C *121/34;* A61K *7/46*

U.S. Cl. 252—522 **2 Claims**

1. A process for perfuming compositions wherein 3-(10-undecenyloxy) propionitrile having the formula

$$CH_2=CH-(CH_2)_9-O-(CH_2)_2CN$$

is added to the compositions in proportions of from 0.1 to 30%, by weight, of said compositions.

4,115,327

PHENOLIC RESIN COLOR DEVELOPING COMPOSITIONS FOR COPYING PAPERS AND METHODS OF PREPARATION

Toyoji Kikuga, and Koji Hirai, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 654,243, Jan. 2, 1976, abandoned. This application Jun. 21, 1977, Ser. No. 808,581

Claims priority, application Japan, Feb. 13, 1975, 50-17513

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.2 **11 Claims**

1. A method of preparing color developing emulsion compositions for copying papers without dry pulverization consisting essentially of:

(a) condensing a reaction mixture consisting essentially of an aldehyde and at least one phenol to provide a phenolaldehyde novolac precondensate having an average of from 2 to 6 phenolic nuclei per molecule,

(b) with agitation means directly emulsifying the resin precondensate of (a) while in a liquid state with the addition of from 1 to 10% by weight of an emulsifier to provide resin particles having a diameter of under about 7 microns, and

(c) adjusting the size of the emulsified particles by treatment of the emulsion with wet pulverizing means; said emulsion composition having a solids content range of phenolic resin from about 20 to about 80 percent by weight.

4,115,328

PROCESS FOR MAKING STABLE SOLVENT-FREE, AQUEOUS EPOXY RESIN DISPERSIONS

Edward G. Bozzi, Yorktown Heights, and Robert C. Nelson, Central Valley, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,530

Int. Cl.[2] C09D *3/40, 3/52, 3/56, 3/58*

U.S. Cl. 260—24 **28 Claims**

1. An improved process for preparing a stable aqueous dispersion having no particles large in size than 5 microns or an aqueous, low organic solvent fine particle emulsion of an epoxy resin having a molecular weight from about 4,000 to about 100,000 useful in forming water-dilutable, heat-curable coating compositions with aminoplast or phenoplast curing systems, which comprises

dissolving said epoxy resin in an organic solvent to prepare a 40 to 80% by weight solution, said organic solvent containing from 1 to 25% by weight based on the epoxy resin of a nonionic surfactant and said organic solvent having a boiling point below 160° C. and being selected from the group consisting of aromatic hydrocarbons, esters, ethers, alcohols, ketones, halogenated aromatic hydrocarbons and mixtures thereof,

adding with stirring sufficient water to give a mixture containing from 30 to 50% by weight water,

subjecting the resulting mixture to homogenizing action using a colloid mill, homogenizer or other high speed, high shear mixer,

removing essentially all the organic solvent present by vacuum distillation at a temperature under 40° C. and with a pressure of about 5 to 100 mm Hg to give an essentially solvent free aqueous dispersion having from about 40 to 65 weight percent epoxy resin, from about 0.5 to 13 weight percent nonionic surfactant and from about 35 to 60 weight percent water; or

removing from 40 to 70 percent of the organic solvent by vacuum distillation under 40° C. and with a pressure of about 5 to 100 mm Hg to give a low organic solvent aqueous emulsion having about 35 to 65 weight percent epoxy resin, from about 0.5 to 13 weight percent nonionic surfactant, from about 8 to 20 weight percent organic solvent and from about 35 to 60 weight percent water, wherein the improvement comprises

using as the nonionic surfactant a dispersing agent selected from the group consisting of the polyoxyethylene esters of fatty, rosin and tall oil acids having 8 to 20 carbon atoms in the acid moiety and having from 5 to 50 moles of poly-(ethylene oxide) per acid molecule.

4,115,329

PRINTING INK COMPOSITIONS

Atsumi Noshiro, Chiba, and Yoshio Inoue, Annaka, both of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of, Japan, part interest to each

Filed Nov. 8, 1976, Ser. No. 740,056

Claims priority, application Japan, Nov. 12, 1975, 50-135907

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—25 **5 Claims**

1. A printing ink composition comprising an ink vehicle of which from about 1 to 70% by weight is a silicone-modified phenolic resin prepared by reacting an oil-soluble solid phenolic resin with an amino group-containing organopolysiloxane having in a molecule, at least one organosiloxane unit represented by the general formula

$$(ZR^1)(R^2)_a(X)_bSiO_{\frac{3-a-b}{2}}$$

where Z is a group selected from the class consisting of $-NH_2$, $-HC_2H_4NH_2$ and $-OR^3NH_2$, R^3 being a divalent hydrocarbon group having 2 to 5 carbon atoms, R^1 is a divalent hydrocarbon group having 1 to 6 carbon atoms, R^2 is a monovalent hydrocarbon group having 1 to 3 carbon atoms, X is a hydroxy group or an alkoxy group having 1 to 6 carbon atoms, *a* is 0, 1 or 2 and *b* is 0, 1 or 2 with the proviso that $a+b$ is 0, 1 or 2, and at least one component selected from the group consisting of high-boiling petroleum solvents, synthetic drying oils, resins, copals, dammars, shellacs, bardened rosins, rosin esters, phenolic resins, phenolic resins modified with rosins, maleic acid resins, alkyd resins, petroleum resins, vinylic resins, polyamid resins, epoxy resins, aminoalkyd resins, polyurethane resins, aminoplast resins, nitrocellulose, ethylcellulose, chlorinated rubbers, cyclic rubbers, casein, dextrin and zein is present in said ink vehicle in addition to said silicone-modified phenolic resin.

5. The printing ink composition as claimed in claim 1, wherein a phenolic resin modified with rosin and a high-boiling petroleum solvent are present in said ink vehicle in addition to said silicne-modified phenolic resin.

4,115,330

NOVEL COATING COMPOSITIONS

Nelson E. Lawson, Trenton, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 604,488, Aug. 14, 1975, Pat. No. 4,035,320, which is a continuation-in-part of Ser. No. 274,409, Jul. 24, 1972, abandoned, and Ser. No. 434,440, Jan. 18, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,613

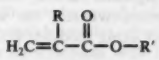
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] C09D *3/40*

U.S. Cl. 260—26 **6 Claims**

1. The polyacrylate reaction product of

(a) an equivalent excess of an acrylic compound of the formula:



wherein R is selected from hydrogen and methyl; R′ is selected from hydrogen, methyl and ethyl; and

(b) a polyester polyol obtained by the condensation of

(i) an aliphatic polycarboxylic acid having a molecular weight of at least 325 and at least 19 carbon atoms, inclusive, said acid being a fumarated resin acid, said resin acid having 16 to 22 carbon atoms, inclusive; with

(ii) an equivalent excess of an aliphatic polyol having at least two hydroxyl groups and a molecular weight of between about 60 to about 250; said reaction of (a) and (b) being under conditions wherein said acrylic compound does not polymerize.

4,115,331

SURFACE SIZING COMPOSITIONS FOR PAPER

Yoichi Tominaga, and Yasuo Shibahara, both of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Division of Ser. No. 474,544, May 30, 1974, Pat. No. 4,030,970. This application Jan. 11, 1977, Ser. No. 758,480

Claims priority, application Japan, May 31, 1973, 48-61503

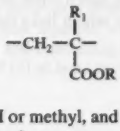
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.[2] C08L *1/28, 3/10, 5/04, 29/04*

U.S. Cl. 260—17.4 CL **10 Claims**

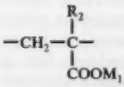
1. A surface sizing composition for paper which forms substantially no scum in a surface sizing press operation even after 8 hours, which comprises in admixture

(I) a copolymer consisting essentially of copolymerized acrylic or methacrylic ester units (A) of the forumla (1):



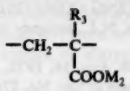
(1)

wherein R_1 is H or methyl, and R is a hydrocarbon radical having 1–18 carbon atoms, copolymerized acrylic or methacrylic acid alkali metal salts units (B) of the forumla (2):



(2)

wherein R_2 is H or methyl and M_1 is an alkali metal and copolymerized acrylic or methacrylic acid salt units or acid units (C) of the formula (3):



(3)

wherein R_3 is H or methyl, and M_2 is ammonium, or a combination of ammonium with a lower alkyl amine cation and/or H, wherein said copolymer has a carboxylic equivalent of 90–500 in the free carboxylic form, a molar ratio of units (A) to units (B) and (C) 1–83:99–17, and a molar ratio of units (B) to (C) of 5–50:95–50, with

(II) a sizing modifier for said copolymer which is selected from the group consisting of modified starch, polyvinyl alcohol, sodium alginate, carboxy methyl cellulose, rosin and petroleum resin, wherein the weight ratio of said copolymer to said sizing modifier is 0.1–50:99.9–50.

4,115,332

WATER-ABSORBENT STARCH COPOLYMERIZATES

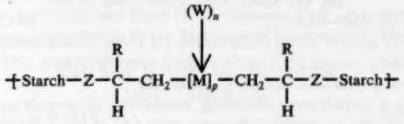
Austin H. Young, and Frank Verbanac, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 680,549, Apr. 27, 1976, Pat. No. 4,079,025. This application Jun. 20, 1977, Ser. No. 808,482

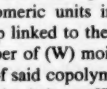
Int. Cl.[2] C08L *3/00*

U.S. Cl. 260—17.4 GC **31 Claims**

1. A water-absorbent starch copolymerizate which is capable of absorbing several times its own weight in water, said starch copolymerizate comprising the copolymerizate product of ethylenically unsaturated starch molecules and ethylenically unsaturated monomers with said ethylenically unsaturated monomers forming a connective polymeric linkage between said copolymerized starch molecules to provide a non-linear lattice of a plurality of starch chains linked together by polymeric linkages represented by the formula:



wherein Starch represents a starch chain of D-glucose units, Z represents an organo group which links the



group

to the carbon atom of the starch chain by a sulfur atom or an oxygen atom, R is a member selected from the group consisting of hydrogen and a monovalent organic radical, M represents a plurality of copolymerized ethylenically unsaturated monomers with "*p*" representing the number of copolymerized monomeric units in said linkage, (W) is a water-attractant group linked to the polymeric linkage and "*n*" represents the number of (W) moieties contained within the polymeric linkage of said copolymerized monomers with the number of (W) moieties being sufficient to impart water-absorbency properties to said copolymerizate.

4,115,333

WARP-RESISTANT REINFORCED THERMOPLASTIC COMPOSITIONS COMPRISING POLYESTER RESINS AND ZINC STEARATE

Donald Lee Phipps, Jr., Mount Vernon, and Allen Dale Wambach, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 18, 1977, Ser. No. 778,945

Int. Cl.[2] C08G *63/02, 63/62*

U.S. Cl. 260—22 R **16 Claims**

1. A thermoplastic molding composition which, after molding, has increased resistance to warpage in comparison with glass fiber reinforced poly(1,4-butylene terehthalate), the composition consisting essentially of, in intimate admixture:

(a) a poly(1,4-butylene terephthalate) resin;

(b) a second resin selected from:

(i) a poly(ethylene terephthalate);

(ii) a polycarbonate; or

(iii) a mixture of (i) and (ii);

(c) a reinforcing agent comprising glass fibers alone or in admixture with a mineral filler in an amount at least sufficient to provide reinforcement; and

(d) a small effective warp resistance improving amount of zinc stearate.

4,115,334

ANTISTATIC VINYLIDENE CHLORIDE COATING COMPOSITION, AND FILM COATED THEREWITH

Clare William Gerow, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 714,268, Aug. 13, 1976, abandoned. This application May 20, 1977, Ser. No. 799,123

Int. Cl.[2] C08K *3/22, 3/30*

U.S. Cl. 260—28.5 D **56 Claims**

1. A coating composition comprising

(a) a copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer copolymerizable therewith, said copolymer containing at least 80% by weight of vinylidene chloride,

(b) about 0.5 to 5% by weight, based on said vinylidene chloride copolymer, of a fatty acid mono- or diglyceride,

(c) about 0.5 to 5% by weight, based on said vinylidene choloride copolymer, of sulfuric acid or a polybasic acid of phosphorus, or mixtures thereof, and

(d) an antisticking agent.

4,115,335

ASPHALT AND RUBBER COMPRISING COMPOSITION

Robert E. Reusser; Lew T. Gray, and Oren L. Marrs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1977, Ser. No. 777,216

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 AS **16 Claims**

1. A composition of matter consisting essentially of

a. about 50 to 70 wt. % of a mineral aggregate,

b. about 15 to 35 wt. % of a finely divided mineral filler,

c. about 5 to 20 wt. % of asphalt,

d. about 0.05 to 7 wt. % of a rubbery radial teleblock copolymer,

e. about 0 to 7 wt. % of oil,

f. about 0 to 0.5 wt. % of a fibrous material.

4,115,336

STABLE AQUEOUS POLYESTER-MONOMER EMULSIONS

Pierre Albert Crouzet, 20 Romney Way, Parkwood, Western Australia, Australia

Continuation-in-part of Ser. No. 711,182, Aug. 3, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,097
Claims priority, application Australia, Aug. 7, 1975, 2687/75; Apr. 27, 1976, 13401/76
Int. Cl.[2] C08J 3/06, 9/28; C08L 67/06
U.S. Cl. 260—29.6 NR 15 Claims

1. A water in resin emulsion formed by mixing
a. water with
b. a mixture consisting essentially of
i. an unsaturated polyester resin having a molecular weight from about 3,100 to 3,600 formed by a condensation polymerization reaction, which is allowed to proceed until the polyester has an acid number of no more than about 25, between polyhydric and polycarboxylic compounds or derivatives thereof, said polyhydric compounds being present in an excess over stoichiometric requirements, at least one of said compounds being unsaturated, the remainder being saturated; and
ii. an unsaturated monomer,
the mixture b) containing no more than about 30% by weight of the unsaturated monomer ii),
wherein said emulsion is so stable that demulsification does not occur when a setting agent of a kind which sets by hydration thereof is added thereto.

4,115,337

PROCESS FOR MANUFACTURING ENAMELS OF POLYESTER-POLYIMIDE RESINS, PARTICULARLY FOR COATING ELECTRIC CONDUCTORS

Ezio Cancilleri, Verdellino (Bergamo), Italy, assignor to Cean S.p.A., Italy

Filed Jan. 8, 1976, Ser. No. 647,604
Claims priority, application Italy, Jan. 15, 1975, 19280 A/75; Dec. 22, 1975, 30621 A/75
Int. Cl.[2] C08J 3/10, 3/12
U.S. Cl. 260—29.2 N 17 Claims

1. A process for obtaining enamels based on aqueous solutions of polyester-polyimide resin in which said resin is obtained by a polycondensation reaction and has a number of reactive free carboxyl groups such as to confer to said resin a free acid number N in excess of 30, said process comprising the steps of:
cooling said resin; then
granulating said resin;
adding said granulated resin to a water bath in a ratio of between 20 and 50 parts to 100 parts of water by weight;
heating the resin-containing bath thus obtained to a temperature within the range of from 30° C. to 70° C.;
adding to said bath comprising said resin, while maintaining said temperature, an aminic salifying agent selected from the group comprising aminoalcohols and tertiary amines for said free carboxyl groups;
adding a catalyst selected from the group of titanium-alkyl compounds; and
stirring said bath while maintaining the above temperature to complete dissolution.

4,115,338

METALLIC TONE COATING COMPOSITION

Sadao Kobayashi, Yokohama, and Yasuo Okita, Oiso, both of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha (Mitsui Toatsu Chem., Inc.), Tokyo, Japan

Continuation-in-part of Ser. No. 488,583, Jul. 12, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,728
Claims priority, application Japan, Jul. 16, 1973, 48-80056
Int. Cl.[2] C08J 3/20; C08K 3/00, 3/08, 5/00
U.S. Cl. 260—29.4 UA 3 Claims

1. A metallic tone resin coating composition comprising
a. a coating resin selected from the group consisting of an acrylic resin, alkyd resin, vinyl chloride resin, urethane resin, unsaturated polyester resin, melamine resin, urea resin, epoxy resin or a combination thereof;
b. for each about 100 parts by dry weight of said coating resin about 0.1–50 parts by weight of particles of a polymer-encapsulated metal powder obtained by activating a metallic powder by treatment with 1) an organic or mineral acid followed by neutralization of the thus-treated powder with an alkali, or 2) an aqueous solution of phosphoric acid or a phosphoric acid ester of an acrylate; and subjecting the thus-activated metallic powder to in situ polymerization in an aqueous medium of at least one vinyl monomer in the presence of a radical polymerization initiator, the amount of such vinyl monomer being such as to form about 0.2–20 parts by weight of said encapsulating polymer per 100 parts of said metallic powder, said metallic powder being at least one of aluminum, brass, bronze, stainless steel, or copper; and
c. a solvent or dispersion medium of the group consisting of toluene, xylene, solvent naphtha, methanol, ethanol, isopropanol, n-butanol, ethyl acetate, butyl acetate, methyl ethyl ketone, methyl isobutyl ketone, trichloroethylene, ethyleneglycol monobutyl ether acetate, water or a combination thereof.

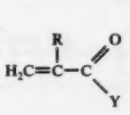
4,115,339

HIGH MOLECULAR-WEIGHT, WATER-SOLUBLE VINYL POLYMERS

Alfred J. Restaino, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

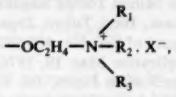
Division of Ser. No. 200,195, Nov. 18, 1978, Pat. No. 3,926,756, which is a continuation of Ser. No. 781,975, Dec. 6, 1968, abandoned. This application Aug. 7, 1975, Ser. No. 602,954
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.[2] C08F 13/00, 1/16, 3/44
U.S. Cl. 260—29.6 HN 16 Claims

1. A water-soluble copolymer having an intrinsic viscosity in 2N sodium chloride solution of from about 6 deciliters per gram to about 30 deciliters per gram at 25° C., said copolymer being prepared by a process comprising (a) irradiating with high energy ionizing radiation at an intensity of from 250 rads to 200,000 rads per hour to a dose of from 1,000 to 200,000 rads, an ammonia free aqueous solution having a pH from about 3 to about 13 and containing from 10% to 45% concentration by weight of (1) at least two monomers conforming to the formula



(2) a mixture of at least one of said monomers with at least one of acrylic acid, vinyl sulfonic acid, water-soluble salt of acrylic acid, or water-soluble salt of vinyl sulfonic acid, said mixture containing at least 15% by weight of said monomer; (3) a mixture of at least one of said monomers with up to 25% of its own weight of acrylonitrile; or (4) a mixture of at least one of said monomers, acrylic acid, or a water-soluble salt thereof, and acrylonitrile containing at least 15% by weight of said

monomer and no more than 25% by weight of acrylonitrile, wherein Y is $-NH_2$ or



wherein R is hydrogen or methyl, R_1, R_2, and R_3 are 1 to 4 carbon alkyl radicals and X^- is an anion, to form an aqueous gel of a water-soluble, high molecular weight copolymer having an intrinsic viscosity of from about 6 deciliters per gram to about 30 deciliters per gram in 2 normal sodium chloride solutions at 25.5° C., and (b) recovering said copolymer from the aqueous copolymer gel.

4,115,340

INVERSION OF WATER-IN-OIL EMULSIONS OF POLYACRYLAMIDE IN HARD WATER

Richard Earl Ellwanger, Tucson, Ariz., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 11, 1977, Ser. No. 795,993
Int. Cl.² C08F 6/14
U.S. Cl. 260—29.6 HN **6 Claims**

1. A process for inverting an anionic water-in-oil emulsion containing from about 5 to 75 weight percent of a polyacrylamide in hard water as the continuous phase of the inverted emulsion, which process comprises diluting said emulsion with a quantity of hard water which is insufficient to break said emulsion but sufficient to effect inversion to an oil-in-water emulsion, agitating the diluted emulsion to effect inversion, and thereafter diluting the oil-in-water emulsion formed with additional hard water.

4,115,341

POLYETHERAMIDE-ACID-IMIDE SOLUTION AND PROCESS FOR PREPARATION THEREOF

Edith M. Boldebuck, Schenectady, and Eugene G. Banucci, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

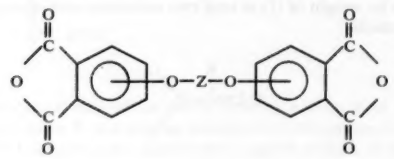
Filed Jan. 24, 1977, Ser. No. 761,946
Int. Cl.² C08K 5/06
U.S. Cl. 260—33.2 R **3 Claims**

1. A polyether amide-acid-imide solution consisting essentially of

(1) as a liquid solvent, 2-(2-methoxyethoxy)ethanol, and dissolved in said liquid solvent

(2) a polyetheramide-acid-imide having an imide content no greater than the maximum imide content at which the polyetheramide-acid-imide is soluble in the solvent at 20° C. and prepared by reacting

(i) at least one aromatic bis(ether anhydride) having the formula

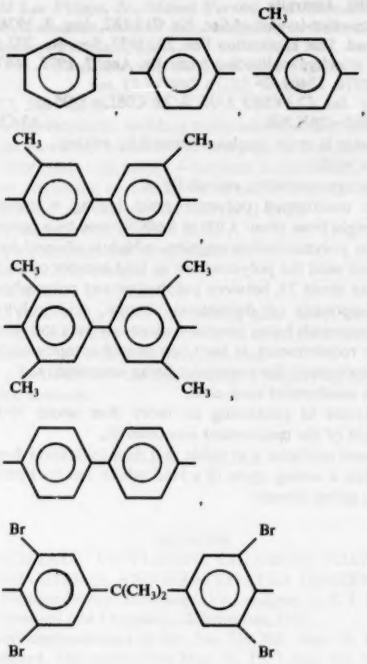


with

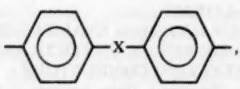
(ii) at least one organic diamine having the formula

$$N_2N-R-NH_2$$

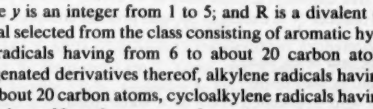
at a temperature and for a time effective to form said polyetheramide-acid-imide, where Z is a member selected from the class consisting of (A) divalent organic radicals having the following formulas



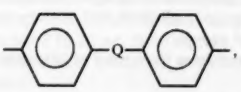
and (B) divalent organic radicals of the general formula



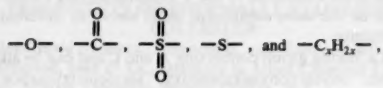
where X is a member selected from the class consisting of divalent radicals of the formulas



where y is an integer from 1 to 5; and R is a divalent organic radical selected from the class consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and divalent radicals of the general formula



where Q is a member selected from the class consisting of



and x is an integer from 1 to 5.

4,115,342

WIRE ENAMEL WITH LOW SOLDERING TEMPERATURE

Thomas A. Shelby, and Shelby W. Gallien, both of Fort Wayne, Ind., assignors to Rea Magnet Wire Co., Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 564,851, Apr. 3, 1975, Pat. No. 3,988,283. This application Sep. 13, 1976, Ser. No. 722,824
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.² C08K *5/01, 5/13;* **C08L** *79/08;* **H01B** *3/22*
U.S. Cl. 260—33.4 P **8 Claims**

1. A wire enamel coating composition capable of forming an insulative coating on a wire characterized by a solderability of less than 1 second at a temperature of about 285°–315° C and a thermoplastic flow temperature of at least 230° C and comprising:

(a) 1 part by weight of a coating composition of a resin mixture containing:

(i) 1 part by weight of an imidized polyester resin containing 4–10% by weight free hydroxyl content, and

(ii) 1.7–2.5 parts by weight of a blocked isocyanate;

(b) about 3 parts by weight of the coating composition of an aromatic solvent capable of dissolving said resin and said blocked isocyanate and containing at least 45% by weight of cresylic acid, with the balance of the solvent having a boiling point of less than 200° C; and

(c) about 0.1 to 10.0% by weight of said resin mixture of a catalyst to promote the reaction of the imidized polyester with the blocked isocyanate.

4,115,343

HOMOGENEOUS DISPERSIONS OF DIORGANOPOLYSILOXANE COMPOSITIONS IN MINERAL OILS

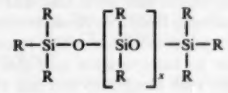
Andre Guillaume, Lyon, and Ferenc Sagi, Bron, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 7, 1976, Ser. No. 693,687
Claims priority, application France, Jun. 6, 1975, 75 17714
Int. Cl.² C08K *5/01*
U.S. Cl. 260—33.6 SB **7 Claims**

1. A storage stable dispersion comprising:

(A) from about 4 to 40 weight percent of an organosiloxane polymer composition comprising

(1) from about 80 to 100 weight percent of an organosiloxane polymer of the formula



wherein R which can be identical or different is an alkyl group of 1 to 3 atoms and *x* is a number between 30 to 2,000,

(2) from about 0 to 20 weight of silica having a specific surface area greater than 50 m^2/g,

(B) from about 55 to 95 weight percent of mineral oil,

(C) from about 1 to 12 weight percent of an ethylene/vinyl acetate copolymer having a vinyl acetate content from about 15 to 40 weight percent and a melt index of from about 2 to 600 grams per 10 minutes.

4,115,344

MOLD CORROSION INHIBITION IN POLY(ARYLENE) SULFIDE PROCESSING

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 5, 1977, Ser. No. 813,061
Int. Cl.² C08K *5/34, 5/22, 5/24, 5/21, 5/16*
U.S. Cl. 260—37 R **24 Claims**

1. A composition of matter comprising poly(arylenesulfide) resin and a corrosion inhibiting amount of at least one ammonia precursor having 0 to 8 carbon atoms and being selected from the group consisting of urea, monohydrocarbyl-substituted ureas, hydrazine, monohydrocarbyl-substituted hydrazines, dicarboxamides, carbamate esters, amino acids, melamine, biuret, and guanidine.

4,115,345

PROCESS FOR TREATING ZIRCON-CONTAINING FOUNDRY SAND

William Raymond Bushey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1976, Ser. No. 740,491
Int. Cl.² C08K *9/02*
U.S. Cl. 260—38 **6 Claims**

1. A process for treating zircon-containing foundry sand to improve the bonding strength of thermosetting resins in molds made therefrom by

(i) intimately contacting zircon sand with an aqueous solution containing at least 0.1 g/liter of an alkali metal silicate, and

(ii) isolating the silicate-treated zircon sand from the aqueous solution containing at least 0.1 g/liter of an alkali metal silicate.

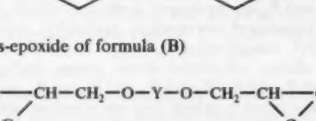
4,115,346

HYDROXY GROUP CONTAINING DIESTERS OF ACRYLIC ACIDS AND THEIR USE IN DENTAL MATERIAL

Albert Gross, Frankfurt am Main, and Roland Schaefer, Friedrichsdorf, Taunus, both of Germany, assignors to Kulzer & Co. GmbH, Bad Homburg von der Hohe, Germany

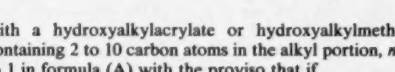
Division of Ser. No. 544,532, Jan. 27, 1975, Pat. No. 4,002,669. This application Jun. 22, 1976, Ser. No. 698,560
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1974, 2406557
Int. Cl.² C08K *3/00, 3/36*
U.S. Cl. 260—42.15 **12 Claims**

1. A monomeric binding agent in dental material, especially in dental filling material, comprising between 30 and 80% by weight of a finely divided filler and a diacrylate prepared by reacting 3-(3,4-epoxycyclohexyl)-8,9-epoxy-2,4-dioxaspiro (5,5) undecane or a bis-epoxide of formula (A)



(A)

or a bis-epoxide of formula (B)



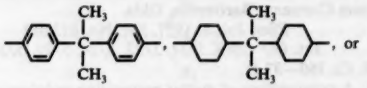
(B)

with a hydroxyalkylacrylate or hydroxyalkylmethacrylate containing 2 to 10 carbon atoms in the alkyl portion, *n* being 0 to 1 in formula (A) with the proviso that if

n is 0, X is –O– and R^1 is –H; and that if

n is 1, X is selected from the group of alkylene with 1 to 10 carbon atoms, C_{1-3}-alkyl substituted alkylene with 1 to 10 carbon atoms, –O–$(CH_2)_m$–O–where *m* is 1 to 10,

$-CH-_2-OCO-(CH_2)_p-COO-CH_2$ where p is 1 to 6, and $-CH-_2-OCO-$, and R^1 is $-H$ or $-CH_3$,
and in formula (B)

Y is  , or

or
tricyclo-[5,2,1,$0^{2,6}$]-decylene.

4,115,347
POLYOLEFIN COMPOSITIONS

Jean-Philippe Pied, Verneuil en Halatte, France, assignor to Societe des Plastiques de Carmaux Scasar, France

Filed Sep. 9, 1975, Ser. No. 611,815
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—42.46 **11 Claims**

1. A polyolefin composition comprising a polyolefin and from about 1 to 15% based on the weight of the polyolefin of an essentially dehydrated kaolinite containing from 51 to 57% by weight silica, from 40 to 46% by weight alumina and less than 3% impurities.

4,115,348
MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

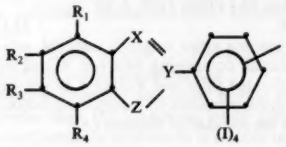
Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 502,330, Sep. 3, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 711,045
Int. Cl.[2] C08K *5/15*
U.S. Cl. 260—45.8 NZ **17 Claims**

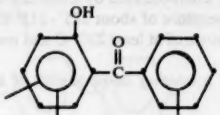
1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one novel multichromophoric compound having the formula:

A-B-C

wherein A is a group having the structure



wherein
X is a nitrogen atom;
Y is a carbon atom;
Z is an oxygen atom;
R_1, R_2, R_3 and R_4 are hydrogen, hydroxyl, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;
I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, said B connecting group is attached to the benzenoid ring in the ortho, meta or para positions from the carbon atom connected to the Y substituent, said I substituents can all be the same substituent listed above or different listed substituents;
B is a linking group connecting A and C and can be alkylene, arylene, oxycarbonylalkyleneoxy, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)-phosphinooxy, alkyloxyphoxphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene, and alkyleneaminoarylene; and
wherein C is a hydroxybenzophenone group having the formula



where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzenoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,115,349
TRIPHENYLPHOSPHINE OXIDE AS A PROMOTER FOR PHOSPHORUS-CONTAINING FLAME RETARDANT

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 3, 1977, Ser. No. 821,375
Int. Cl.[2] C08K *5/34, 5/51, 5/53*
U.S. Cl. 260—45.8 NT **24 Claims**

1. A flame-resistant synthetic resin composition comprising (1) at least one synthetic resin, (2) a phosphorus-containing flame retardant comprising the reaction product of (a) at least one phosphorus oxide compound of the formula $(P_2O_5)_{0.5-1.0}(-H_2O)_{0.0-1.5}$, (b) melamine, and (c) at least one saturated open-chain polyol containing from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups per molecule, which reaction product has been heated prior to incorporation into said synthetic resin composition under such conditions that said reaction product will not cause significant foaming of said synthetic resin composition when said synthetic resin composition is subjected to molding conditions; and (3) triphenylphosphine oxide, wherein said phosphorus-containing flame retardant is present in an amount that alone would be insufficient to impart to said synthetic resin composition a flame resistance rating of V-O according to the modified U.L.-94 test and wherein said triphenylphosphine oxide is present in an amount which enhances the flame resistance provided by the phosphorus-containing flame retardant.

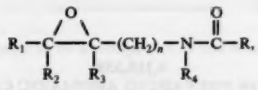
4,115,350

PRODUCTION OF THERMALLY STABILIZED POLYESTER

Stanley David Lazarus, Petersburg, and Kalidas Chakravarti, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

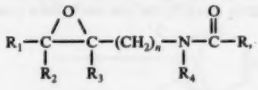
Filed Jul. 27, 1977, Ser. No. 819,654
Int. Cl.[2] C08K 5/04; C08G 63/70, 63/76
U.S. Cl. 260—45.8 A 11 Claims

1. A thermally stabilized high molecular weight linear terephthalate condensation polyester having incorporated therein a thermally stabilizing amount of a stabilizer consisting of an epoxy compound having 5 to 25 carbon atoms in the molecule and selected from the group having the formula



where R represents the radical remaining after removal of the carboxyl group from a monocarboxylic acid, R_1, R_2, R_3 and R_4 represent hydrogen or hydrocarbon radicals, and n is an integer that can be 0 to 3, said thermally stabilized polyester having a free carboxyl concentration of less than 15 gram equivalents of carboxyl groups per 10^6 grams of polyester.

6. In a process for the preparation of a high molecular weight linear terephthalate condensation polyester wherein terephthalic acid is reacted with a glycol containing 2 to 10 carbon atoms per molecule under esterification conditions and the resulting esterification product is polycondensed, the improvement which comprises providing a reduction in the free carboxyl content of the polyester to a carboxyl concentration of less than 15 gram equivalents per 10^6 grams of polyester by adding to the polyester after final polycondensation of the polyester a thermally stabilizing amount of a stabilizer comprising an epoxy compound having 5 to 25 carbon atoms in the molecule and selected from the group having the formula



where R represents the radical remaining after removal of the carboxyl group from a monocarboxylic acid, R_1, R_2, R_3 and R_4 represent hydrogen or hydrocarbon radicals, and *n* is an integer from 0 to 3.

4,115,351

FLAME RETARDANT COMPOSITION

Yasushi Joh, Osaka, Japan

Continuation of Ser. No. 414,793, Nov. 12, 1973, abandoned.
This application Jun. 9, 1975, Ser. No. 585,053
Int. Cl.[2] C08K 5/52
U.S. Cl. 260—45.9 NP 5 Claims

1. A synthetic fiber containing in the form of finely powdered crystals coated with an inactive material at least one inorganic compound in an amount up to 10% based on the total weight of the fiber, said inactive material being selected from higher paraffin, aliphatic or aromatic hydrocarbon having more than 10 carbon atoms, petrolatam, paraffin jelly, liquid paraffin, mineral oil and vegetable oil, said inorganic compound comprising an ammonium salt of an acid selected from the group consisting of phosphoric acid and metaphosphoric acid, said synthetic fiber being made of polyvinyl alcohol or a copolymer of acrylonitrile.

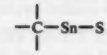
4,115,352

HEAT STABILIZER COMPOSITION FOR HALOGENATED RESINS

Joseph Michael Bohen, King of Prussia, and Sameeh Said Toukan, Phoenixville, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 23, 1977, Ser. No. 799,862
Int. Cl.[2] C08K 5/59, 5/58, 5/36
U.S. Cl. 260—45.75 B 18 Claims

1. A composition of matter comprising a mixture of (a) an alkali or alkaline earth metal salt of a mercaptan or mercapto acid and (b) a sulfur-containing organotin compound having a



group, or a sulfur-containing antimony compound having a Sb—S group, said mixture having a weight ratio of (a) to (b) ranging between about 0.05:1 and about 3:1.

10. The composition of claim 1 dispersed in a halogen containing vinyl or vinylidene resin in which the halogen is attached directly to at least one carbon atom, said composition dispersed in said resin in an amount sufficient to improve the heat stability thereof.

4,115,353

NITROGENOUS POLYMER COMPOSITION EMITTING REDUCED AMOUNTS OF HYDROGEN CYANIDE ON COMBUSTION

Gary L. Deets, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 22, 1977, Ser. No. 817,941
Int. Cl.[2] C08K 3/26
U.S. Cl. 260—45.75 C 5 Claims

1. A polymer composition comprising a styrene/acrylonitrile copolymer comprising from 10 to 90 percent of acrylonitrile and from 1 to 10 percent by weight, based on the polymer weight, of an alkali metal carbonate selected from the group consisting of sodium carbonate and potassium carbonate and from 1 to 10 percent by weight of cupric oxide.

4,115,354

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, and Thomas J. Hoogebroom, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 429,643, Dec. 28, 1973, Pat. No. 3,933,734.
This application Jan. 20, 1976, Ser. No. 650,654
Int. Cl.[2] C08K 5/42
U.S. Cl. 260—45.7 S 4 Claims

1. A flame retardant carbonate polymer composition comprising in admixture an aromatic carbonate polymer and 0.01 to about 10 weight percent based on the weight of the aromatic carbonate polymer composition of an additive which is the metal salt of a polymeric aromatic sulfonate or mixtures thereof, or a mixture of the metal salt of a polymeric aromatic sulfonate and the metal salt of a monomeric aromatic sulfonate, wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkali earth metal salts and mixtures thereof.

4,115,355

NOVEL DERIVATIVES USEFUL AS ADDITIVES FOR INHIBITING THE DETERIORATION OF DEGRADABLE SUBSTANCES

Kuniaki Goto, Tokyo, and Kazumi Kodama, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,648
Claims priority, application Japan, Dec. 18, 1975, 50-151078
Int. Cl.[2] C07C *39/16;* C01M *1/54*
U.S. Cl. 260—45.95 H 8 Claims

1. A stabilized composition of a degradable oily or polymeric substance comprising an oily or polymeric degradable substance and an amount effective for inhibiting the deterioration of the degradable substance of 2,2'-methylene-bis(4-methyl-cyclopentyl phenol) as an active ingredient.

7. 2,2'-Methylene-bis(4-methyl-cyclopentyl phenol).

4,115,356

SELF ADHERING ROOM TEMPERATURE VULCANIZABLE SILICONE ELASTOMERS

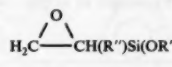
John R. Hilliard, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 18, 1977, Ser. No. 816,787
Int. Cl.[2] C08L *83/04*
U.S. Cl. 528—18 16 Claims

1. A composition storage stable in the absence of moisture which vulcanizes at room temperature on exposure to moisture comprising a product resulting from mixing (A) 100 parts by weight of polydiorganosiloxane consisting essentially of repeating units of the formula R_2SiO having a viscosity of at least 0.10 Pa.s at 25° C in which each R represents a monovalent hydrocarbon or halogenated monovalent hydrocarbon radical of from 1 to 18 inclusive carbon atoms, said siloxane having an average of from 1.5 to about 2 silicon-bonded hydroxyl radicals per molecule, (B) from 0.5 to 15 parts of an organotriacetoxysilane of the formula

$$R'Si(\overset{O}{\overset{\|}{O}}CCH_3)_3$$

in which R' represents a monovalent radical selected from the group consisting of lower alkyl, fluorinated lower alkyl, alkenyl, and aryl radicals, there being at least one organotriacetoxysilane molecule per hydroxyl radical of polyorganosiloxane (A), and (C) from 0.1 to 2.5 parts of a compound of the formula



in which R'' is a radical attached to silicon by a carbon to silicon bond and selected from the group consisting of divalent hydrocarbon radicals of from 1 to 10 carbon atoms and divalent radicals of less than 10 carbon atoms which are composed of carbon, hydrogen, and oxygen atoms, the last being in the form of ether linkages, not as an atom of a ring, and R''' is selected from the group consisting of aliphatic hydrocarbon radicals of less than 5 carbon atoms.

4,115,357

POLYESTERS OF 1,2-BIS(HYDROXYPHENYL)ETHANES AND AROMATIC DICARBOXYLIC ACIDS

Oliver D. Deex, Clayton, Mo., and Virgil W. Weiss, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 754,199
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—294 19 Claims

1. A linear polyarylene ester consisting essentially of the condensation product of an aromatic dicarboxylic acid and a diphenol wherein the aromatic dicarboxylic acid comprises at least one acid selected from the group consisting of isophthalic acid, terephthalic acid, bis(4-carboxyphenyl)ether, bis(4-carboxyphenyl)sulfone, bis(4-carboxyphenyl)methane, and 1,2-bis(4-carboxyphenyl)ethane and wherein the diphenol comprises from about 75 to 96 mole percent 1,2-bis(4-hydroxyphenyl)ethane, from about 4 to 20 mole percent of a bis(hydroxyphenyl)sulfide and from about 21 to 0 mole percent of at least one diphenol selected from the group consisting of 1,2-bis(3-hydroxyphenyl)ethane, 1-(3-hydroxyphenyl)-2-(4-hydroxyphenyl)ethane, bis(4-hydroxyphenyl)propane, bis(4-hydroxyphenyl)ether, and bis(4-hydroxyphenyl)sulfone.

4,115,358

PROCESS FOR PREPARING AROMATIC CARBONATE POLYMERS

Jorgen H. Vestergaard, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 302,103, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 28,055, Apr. 13, 1970, abandoned. This application Sep. 3, 1976, Ser. No. 720,127
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—196 5 Claims

1. A process of preparing a carbonate polymer having improved resistance to thermal degradation and improved impact resistance, which process consists of (a) mixing 2,2 bis(4-hydroxyphenyl) propane in an aqueous medium with a solvent for the carbonate polymer, a molecular weight regulator and a catalyst, (b) adding 70–95 weight percent of the stoichiometric quantity of a carbonate precursor with the 2,2 bis(4-hydroxyphenyl) propane while adding, simultaneously with the carbonate precursor, sufficient alkali metal hydroxide to maintain a pH of 6.0 to about 10.0 and (c) adding sufficient alkali metal hydroxide solution to raise the pH to at least 11.0 and (d) maintaining said pH while reacting the remaining amount of the stoichiometric quantity of the carbonate precursor.

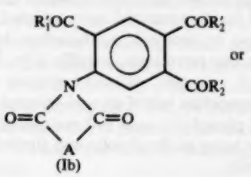
4,115,359

CROSSLINKABLE POLYMERS PREPARED FROM MALEIMIDYL SUBSTITUTED TRIMELLITIC ACID COMPOUNDS

Roland Darms; Josef Pfeifer, both of Therwil, and Vratislav Kvita, Muttenz, all of Switzerland, assignors to CIBA-Geigy Corporation, Ardsley, N.Y.

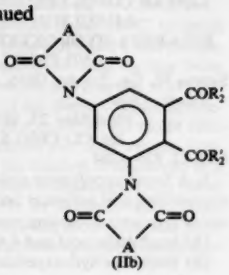
Filed Jun. 15, 1976, Ser. No. 696,350
Claims priority, application Switzerland, Jun. 18, 1975, 7955/75
Int. Cl.[2] C08G *73/12*
U.S. Cl. 528—170 8 Claims

1. A crosslinkable polymer which has an average molecular weight of at least 1,200, or the corresponding cyclized imide derivative, which is manufactured by reacting at a temperature between about −50° and 300° C. in the melt or in an inert organic solvent or solvent mixture 0.5 to 100 mol % of a compound of the formula Ib or IIb



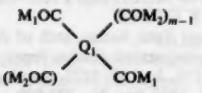
(Ib)

-continued



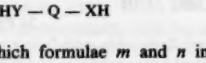
(IIb)

and 0 to 99.5 mol % of a compound of the formula IV



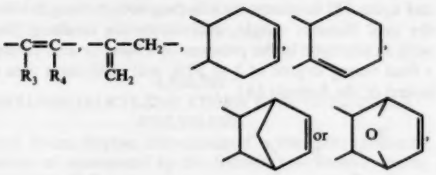
(IV)

with substantially stoichiometric amounts of a compound of the formula V



(V)

in which formulae *m* and *n* independently of one another represent the number 1 or 2, A represents a radical of the formula

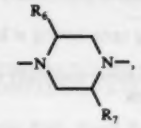


R_2' represents phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy with 1 to 18 carbon atoms or the two R_2''s conjointly represent the —O— grouping,

R'_1 represents a chlorine atom, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; or alkoxy of 1 to 18 carbon atoms,

M^+ represents an alkali metal cation, a trialkylammonium cation with 3–24 carbon atoms or a quaternary ammonium cation, R_3 and R_4 independently of one another represent hydrogen, chlorine or bromine, X and Y independently of one another represent

and R_5 = hydrogen, alkyl with 1–4 carbon atoms or phenyl, Q represents an aliphatic radical with at least 2 carbon atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, or —Y—Q—X represents the grouping



R_6 and R_7 independently of one another represent hydrogen, methyl or phenyl and Q_1 represents an aliphatic radical or a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carbonyl and carboxyl groups are bonded to different carbon atoms and the carboxyl groups are each in the ortho-position relative to a carbonyl group,

M_1 represents a chlorine atom, a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; or alkoxy with 1 to 18 carbon atoms, or when *m* or *n* is 2, M_1, conjointly with M_2, forms the —O— grouping

and the groups $—COM_1$ and $—COM_2$ are bonded to different carbon atoms and the $—COM_1$ groups are each in the ortho-position relative to a $—COM_2$ group.

4,115,360

POLYETHER UREA EPOXY ADDITIVES

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,815

Int. Cl.[2] C08G 59/50

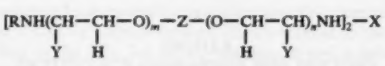
U.S. Cl. 528—94 **22 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:

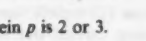
a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;

a curing amount of a polyamine curing agent having at least 3 reactive amino hydrogens; and,

an effective amount of an additive consisting essentially of a polyether ureylene of the formula:



wherein X is a C═O radical or a radical derived from a diisocyanate; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms; Y is hydrogen, a methyl radical or an ethyl radical; and *m* and *n* are numbers selected such that the molecule has a molecular weight of from about 4000 to about 4500; R is hydrogen; or, a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms; or, a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms or, are branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; or, an amino alkyl amine radical of the formula:



wherein *p* is 2 or 3.

4,115,361

POLYETHER UREA EPOXY ADDITIVES

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,878

Int. Cl.[2] C08G 59/50

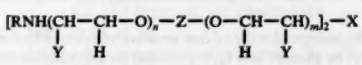
U.S. Cl. 260—47 EN **23 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises;

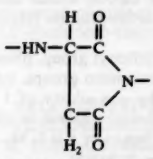
a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;

a curing amount of a polyamine curing agent having at least 3 reactive amino hydrogens; and,

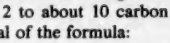
an effective amount of an additive consisting essentially of a polyether succinimide of the formula:



wherein X is a



radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms; Y is hydrogen, a methyl radical or an ethyl radical; and *m* and *n* are numbers selected such that the molecule has a molecular weight of from about 4000 to about 4500; R is hydrogen, or, a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms; or, a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms; or, are branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; or, an amino alkyl amine radical of the formula:



wherein *p* is 2 or 3.

4,115,362

PROCESS FOR PREPARING POLYESTERS

Hiroo Inata, and Shoji Kawase, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 619,495, Oct. 3, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,628

Int. Cl.[2] C08G *63/18, 63/22*

U.S. Cl. 528—190 **9 Claims**

1. A process for preparing polyesters which comprises

1. a first step of reacting (A) a difunctional carboxylic acid containing at least 60 mole% of an aromatic dicarboxylic acid, (B) 0 to 80 mole%, based on component (A), of an aliphatic diol and (C) an aromatic monohydroxy compound selected from the group consisting of phenol, cresol and naphthol, the total amount of components (B) and (C) used in the first step being at least 210 mole% based on component (A), the reaction being carried out in the presence of a catalyst and at a temperature of 200° to 350° C. until the degree of esterification reaches 80 to 98%, and

2. subsequent to the first step, a second step of adding to the reaction product of the first step 0 to 80 mole%, based on component (A), of component (B), and (D) an aromatic dihydroxy compound, the total amount of components (B) and (D) used in the second step being 95 to 130 mole% based on component (A), and reacting the resultant mixture at a temperature of 200° to 350° C., the total amount of component (B) used in the first and second steps being 0 to 80 mole% based on component (A).

4,115,363

LINEAR COPOLYESTERS OF ISOPHTHALIC ACID 4,4'-SULFONYLDIBENZOIC ACID, BIS(4-BETA-HYDROXYETHOXYPHENYL) SULFONE AND ETHYLENE GLYCOL

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 27, 1976, Ser. No. 690,482

Int. Cl.[2] C08G *63/18, 63/66, 63/68*

U.S. Cl. 528—294 **11 Claims**

1. A linear copolyester suitable for use in the packaging of comestibles, said polyester being the polymeric reaction product of reactants consisting essentially of

(A) isophthalic acid and 4,4'-sulfonyldibenzoic acid, and

(B) bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol.

4,115,364

PROCESS FOR PRODUCING MODIFIED PHENOLIC NOVOLAK FIBERS

Isao Kimura, Suita, and Sizukuni Yata, Settsu, both of Japan, assignors to Nippon Kynol Incorporated, Osaka, Japan

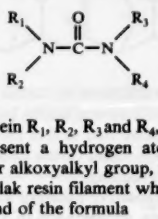
Continuation of Ser. No. 370,776, Jun. 18, 1973, abandoned. This application Sep. 13, 1976, Ser. No. 722,589

Claims priority, application Japan, Jun. 19, 1972, 47-61623; Sep. 7, 1972, 47-89777; Dec. 19, 1972, 47-128032; Feb. 24, 1973, 48-22478

Int. Cl.[2] C08G *14/08*

U.S. Cl. 260—841 **24 Claims**

1. A process for producing non-flammable, anti-fusing novolak resin filament having improved heat resistance and bending properties which comprises melt-spinning a fiber-forming novolak resin which contains a fiber-forming thermoplastic synthetic polyamide resin selected from the group consisting of nylon 6, nylon 11, nylon 12, nylon 66, nylon 610, nylon 611, and nylon 612 in an amount less than 40% by weight based on the total filament weight, and curing the resulting filament with an aldehyde in the presence of a basic or acid catalyst to a final curing degree of 3 to 30%, and applying a urea compound of the formula (A)



(A)

wherein R_1, R_2, R_3 and R_4, which may be the same or different, represent a hydrogen atom, lower hydroxyalkyl group or lower alkoxyalkyl group, to said novolak resin to provide the novolak resin filament which contains in its fiberous structure a bond of the formula

in the amount of 0.5 to 25% by weight based on the weight of the filament.

4,115,365

PROCESS FOR PREPARING AMINOMETHYL DIARYL COMPOUND RESINS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 802,690, Jun. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 662,392, Mar. 1, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,443

Int. Cl.[2] C08G *12/42, 14/06*

U.S. Cl. 528—132 **8 Claims**

1. A method for the preparation of aminomethyl diaryl

compound resins in the absence of halomethylation or halomethylated materials which method consists of:

(a) heating at a temperature of from about 75° C. to about reflux, a mixture consisting of an aldehyde, a diaryl compound, a saturated monocarboxylic acid having from about 1 to about 10 carbon atoms and a strong acid catalyst wherein the molar ratio of the diaryl compound:aldehyde ranges from about 1:1 to about 1:10, the molar ratio of diaryl compound:monocarboxylic acid ranges from about 1:1 to about 1:9, and the catalyst is employed in a molar ratio of the diaryl compound:catalyst from about 1:0.001 to about 1:0.3 to form an aldehyde-diaryl resin, having a molecular weight between about 1000 and 3000,

(b) stripping off the excess monocarboxylic acid under vacuum, and then

(c) adding at least about 1 mole of a primary or secondary amine containing at least one additional nontertiary amino group per reactive group on the aldehyde-diaryl resin to form a soluble, fusible resin.

4,115,366
PHENOLIC RESIN-MELAMINE COMPOSITION

Jerome C. Kellner, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 748,675, Dec. 8, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 868,029

Int. Cl.² C08G 14/10, 14/12

U.S. Cl. 528—131 **8 Claims**

1. A thermosettable molding composition comprising:

(a) a water-insoluble phenol-aldehyde resin consisting essentially of an acid-catalyzed phenol-aldehyde resin having 0.5–0.9 moles of aldehyde per mole of phenol reacted to a water-insoluble stage;

(b) 10–33 parts of hexamethylenetetramine per 100 parts of said phenol-aldehyde resin; and

(c) 30–60 parts by weight of melamine per 100 parts by weight of said phenol-aldehyde resin.

4,115,367
PERFLUOROALKYLENE ETHER BIBENZOXAZOLE POLYMERS

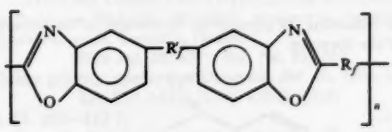
Robert C. Evers, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 21, 1977, Ser. No. 817,658

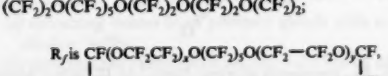
Int. Cl.² C08G 73/22

U.S. Cl. 528—210 **7 Claims**

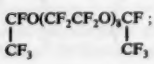
1. A perfluoroalkylene ether bibenzoxazole polymer consisting essentially of recurring units having the following formula:



wherein R_f' is $(CF_2)_2O(CF_2)_2O(CF_2)_2$, $(CF_2)_2O(CF_2)_5O(CF_2)_2$ or $(CF_2)_2O(CF_2)_5O(CF_2)_2O(CF_2)_2O(CF_2)_2$;



where $(x+y)$ equals 5 or 6, or



and n is an integer equal to at least 2.

4,115,368
CROSSLINKABLE POLYMERS OF COMPOUNDS CONTAINING 5-MALEIMIDYL-ISOPHTHALIC ACID DERIVATIVES

Martin Roth, Basel; Roland Darms, and Josef Pfeifer, both of Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

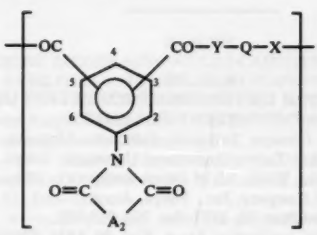
Filed Jun. 15, 1976, Ser. No. 696,349

Claims priority, application Switzerland, Jun. 18, 1975, 7954/75

Int. Cl.² C08G 73/12

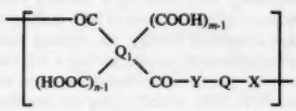
U.S. Cl. 528—229 **12 Claims**

1. A crosslinkable polymer with an average molecular weight of at least 1000, which is characterized in that it consists of 0.5 to 100 mol % of recurring structural elements of the formula III



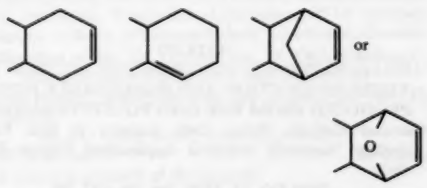
(III)

and 0 to 99.5 mol % of recurring structural elements of the formula IV



(IV)

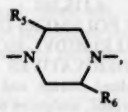
and contain at least three structural elements of the formula III, and the —CO—groups in formula III are bonded to the benzene ring in the 2,3-, 3,4- or 2,3-position, m and n independently of one another represent the number 1 or 2, A_2 represents a radical of the formula



R_2 and R_3 independently of one another represent hydrogen, chlorine or bromine, X and Y independently of one another represent

where R_4 is hydrogen, alkyl with 1 to 4 carbon atoms or phenyl, Q represents an aliphatic radical with at least 2 carbon atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or

heterocyclic-aromatic radical, or —Y—Q—X— represents the grouping



R_5 and R_6 independently of one another represent hydrogen, methyl or phenyl and Q_1 represents an aliphatic radical or represents a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical in which the carbonyl and carboxyl groups are bonded to different carbon atoms and the carboxyl groups are each in the ortho-position relative to a carbonyl group, or the corresponding cyclized imide derivative.

4,115,369

PROCESS FOR CONTINUOUS PRODUCTION OF OXYMETHYLENE POLYMERS

Akitoshi Sugio, Ohmiya; Tomotaka Furusawa, Matsudo; Katsumasa Tanaka, Tokyo; Toshikazu Umemura, Tokyo, and Hiroyuki Urabe, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,905

Claims priority, application Japan, Nov. 29, 1976, 51-142324

Int. Cl.² C08G *2/10*

U.S. Cl. 526—65 **7 Claims**

1. A process for continuously producing an oxymethylene polymer by continuously polymerizing a starting monomer containing at least 50 mole% of trioxane in bulk in the presence of a catalyst, which comprises feeding the starting monomer into a first-stage polymerization reactor having a self-cleaning action to perform a first-stage polymerization reaction until the conversion reaches 40 to 70%, withdrawing the reaction mixture as a powder from the outlet of the first-stage polymerization reactor, feeding the reaction mixture into a second-stage polymerization reactor having a stirring action to perform a second-stage polymerization reaction until the conversion reaches 95 to 100%, and then withdrawing the polymerization product as a powder from the outlet of the second-stage polymerization reactor.

4,115,370

UNSATURATED POLYESTERAMIDES, METHOD FOR THEIR PRODUCTION AND HARDENABLE RESINS PRODUCED FROM THE SAID POLYESTERAMIDES

Giovanni Corrado, Rome, Italy, assignor to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Feb. 11, 1976, Ser. No. 657,268

Claims priority, application Italy, Feb. 21, 1975, 20489 A/75

Int. Cl.² C08G *63/68*

U.S. Cl. 260—22 CQ **31 Claims**

1. Unsaturated polyesteramide composition which comprises an unsaturated linear polymer having ester bonds and unsaturations, and radicals of a COOH-terminated saturated polyamide in its linear chain, said ester bonds being located between the amide bonds of the polyamide radical and the unsaturations and in the chain wherein ester bonds are present, said ester bonds are located between the amide bonds and the unsaturations.

4,115,371

STABILIZATION OF POLYCONDENSATES OF POLYETHYLENE TEREPHTHALATE

Peter Bier, and Rudolf Binsack, both of Krefeld, Germany, assignors to Bayer Aktienfesellschaft, Leverkusen, Germany

Filed Jun. 2, 1977, Ser. No. 802,858

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626827

Int. Cl.² C08G *63/34, 63/32*

U.S. Cl. 528—279 **16 Claims**

1. A process for the preparation of a high-molecular weight light colored polyethylene terephthalate which has an intrinsic viscosity of greater than about 0.7 dl/g measured at 25° C. in 1:1 phenol tetrachloroethane and a yellow shade *b* value by the Gardner method of less than about 6 comprising

A. esterification or transesterification at a temperature of between about 150 and 250° C. in the presence of an appropriate catalyst of

(1) a dicarboxylic component comprising at least 90 mol % of terephthalic acid and terephthalic acid dialkyl ester, and

(2) about 1.05 to 5 mols per mol of acid component of a diol component comprising at least 90 mol % of ethyleneglycol, until a conversion of greater than about 95% is achieved, and then

B. polycondensation at a temperature between about 200° and 270° C. under reduced pressure in the presence of

(1) about 3×10^{-2} to 5×10^{-5} mol %, based on mols of said acid component, of titanium tetrabutylate, and

(2) about 0.02 to 2 mol %, based on mols of said acid component, of metaphosphoric acid or its alkali or alkaline earth metal salts.

4,115,372

NOVEL COPOLYAMIDEIMIDES

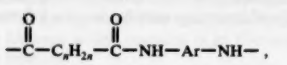
Kemal B. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 21, 1977, Ser. No. 761,428

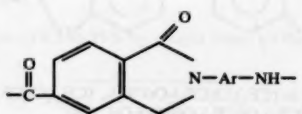
Int. Cl.² C08G *73/14*

U.S. Cl. 528—73 **6 Claims**

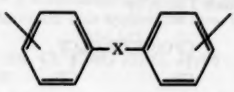
1. A copolyamideimide characterized by solvent solubility, injection moldability, and an inherent viscosity of at least 0.5 measured at 30° C. using a 0.5 weight percent solution of said copolyamideimide dissolved in N-methylpyrrolidone or m-cresol and further characterized by having from about 30 percent to about 70 percent of the recurring units of the formula:



and the remaining 30 percent to 70 percent of the recurring units of the formula:



wherein C_nH_{2n} represents alkylene from 7 to 12 carbon atoms, inclusive, and Ar is the divalent radical



wherein X is selected from the group consisting of —SO_2—, —CO—, —O—, and alkylene from 1 to 4 carbon atoms, inclusive.

4,115,373

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES CONTAINING ISOCYANURATE GROUPS

Gerhard Henes, Leverkusen; Hans Jürgen Müller, Cologne; Pramod Gupta, Bedburg-Erft, and Joachim Zirner, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 1, 1976, Ser. No. 737,747

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551634

Int. Cl.² C07D *251/12;* C08G *18/18, 18/77, 18/82*

U.S. Cl. 528—48 10 Claims

1. A process for the production of polyisocyanates containing isocyanurate groups and having a monomeric diisocyanate content, based on solids, of at most 0.7%, by weight, comprising (1) partially trimerizing the isocyanate groups in organic diisocyanates in the presence of catalysts which accelerate the trimerizing reaction of isocyanate groups and (2) terminating the trimerizing reaction at the desired degree of trimerization by thermally decomposing the catalyst used or by deactivating the catalyst used by adding a catalyst poison, wherein

(a) Mannich bases are used as catalysts and

(b) the trimerizing reaction is carried out in the presence of inert solvents at a temperature below 60° C.

4,115,374

SUBSTRATES FOR ANGIOTENSIN CONVERTING ENZYME

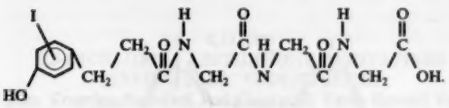
James Walter Ryan, 3420 Pionciana Ave., Miami, Fla. 33133, and Alfred Chung, 8781 SW 87th St., Miami, Fla. 33173

Filed May 10, 1977, Ser. No. 795,497

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R 6 Claims

1. A composition of matter consisting essentially of



4,115,375

METHOD OF ISOLATION AND RECOVERY OF PROTEIN HORMONES, DERIVING FROM PITUITARY TISSUES USING POLYETHYLENE GLYCOL

Erik Pedersen, Ølstykke, Denmark, assignor to Nordisk Insulinlaboratorium, Gentofte, Denmark

Filed Jul. 25, 1977, Ser. No. 819,019

Claims priority, application Denmark, Jul. 30, 1976, 3468/76

Int. Cl.² A61K *35/46;* C07G *7/026*

U.S. Cl. 260—112 R 3 Claims

1. A method of isolating and recovering the growth hormone and a fraction containing the hormones FSH ad LH from pituitary tissues, comprising the steps of

(a) extracting tissues from pituitary glands with an aqueous alkaline buffer,

(b) admixing the extract with an aqueous solution of polyethylene glycol (PEG) in an amount corresponding to 10–14% PEG by weight per volume before or after adjusting the pH to from 4.5 to 5.0,

(c) isolating the precipitated growth hormone,

(d) admixing the supernatant from the previous step with an aqueous solution of polyethylene glycol and

(e) isolating a mixture of the hormones FSH and LH precipitated in step d).

4,115,376

BLAND NEUTRALIZED CASEIN

Steven B. Zavagli, Elmwood Park, and Robert L. Kasik, Berwyn, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Continuation of Ser. No. 455,511, Mar. 27, 1974, abandoned.

This application Feb. 18, 1976, Ser. No. 658,906

Int. Cl.² A23J *3/02*

U.S. Cl. 260—120 14 Claims

1. A process for producing a bland neutralized milk casein comprising mixing milk acid casein granules with a magnesium or potassium salt solution and maintaining the mixture at a temperature of at least 150° F. until a coagulum of the casein is formed; separating the coagulum from the resulting mother liquid; forming an aqueous slurry of the coagulum and holding the temperature of the slurry at between about 100° F. and about 210° F., adding to the slurry a non-toxic, water-soluble magnesium or potassium base in an amount sufficient to neutralize the salt-treated acid casein to a pH of between 6.0 to 8.0, and separating the neutralized casein from the slurry to produce a white, bland, neutralized casein.

4,115,377

RUBINE MIXED STRONTIUM-CADMIUM SALTS OF 3-CHLORO-4-METHYL-6-SULFOPHENYLAZO-HYDROXYNAPHTHOIC ACID

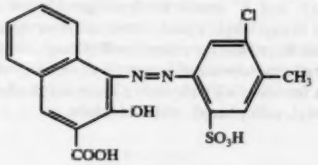
Richard Knight Putney, Hudson Falls, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 31, 1977, Ser. No. 764,322

Int. Cl.² C09D *45/12, 45/22;* D06P *1/46, 3/79*

U.S. Cl. 260—151 3 Claims

1. A water-insoluble strontium-cadmium salt of the azo dyestuff of the formula



said salt having a gram atom ratio of strontium to cadmium ranging from 1:1 to 5:1.

4,115,378

WATER SOLUBLE REACTIVE AZODYESTUFFS CONTAINING A FLUOROTRIAZINYL GROUP ATTACHED VIA A NITROGEN BRIDGE TO THE DYESTUFF MOLECULE

Hans-Samuel Bien, Burscheid; Erich Klauke, Odenthal-Hahnenberg, and Klaus Wunderlich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 721,180, Apr. 15, 1968, abandoned.

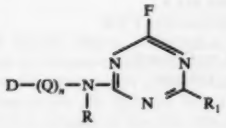
This application Jun. 8, 1971, Ser. No. 151,149

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1967, 52,178

Int. Cl.² C09B *62/04, 62/06, 62/08, 62/10*

U.S. Cl. 260—146 T 24 Claims

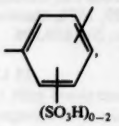
1. A reactive dyestuff of the formula

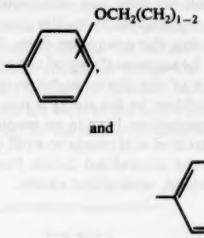


wherein

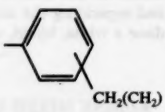
D stands for the radical of a water-soluble sulfonic acid containing azo dyestuff;

R stands for hydrogen or lower alkyl;
Q stands for CO, SO_2, CH_2, CH_2CO,





and



n stands for 0 or 1, —(Q)$_n$—N(R) being linked with a nuclear aromatic carbon atom of D; R_1 stands for NH_2, hydroxy; mercapto; methyl; trichloromethyl; phenyl; methylphenyl; chlorophenyl; sulfophenyl; hydroxyphenyl; morpholino; piperidino; hydrazino; N-methylhydrazino; N—(R_{10})—R'; wherein R_{10} stands for lower alkyl, cyano lower alkyl, hydroxy lower alkyl, phenyl or phenyl substituted by a member selected from the class consisting of chlorine, bromine, lower alkyl, lower alkoxy, sulfo, and carboxy; and R' stands for hydrogen, lower alkyl, hydroxy lower alkyl, cyano lower alkyl or benzyl; OR_{11} wherein R_{11} stands for phenyl, sulfophenyl, lower alkyl or lower alkoxy substituted lower alkyl; or SR_{12} wherein R_{12} stands for lower alkyl, hydroxy lower alkyl, phenyl, chlorophenyl, sulfophenyl; and F is fluoro.

4,115,379

DYESTUFF SALTS

Hermann Perrey, Krefeld; Karlheinz Wolf, Leverkusen; Erich Eimers, Krefeld; Konrad Nonn, Leverkusen, and Reinhold Hörnle, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

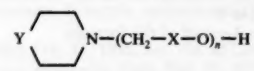
Filed Aug. 3, 1976, Ser. No. 711,143

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1975, 2534830

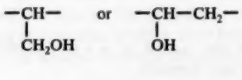
Int. Cl.[2] C09B *29/22*

U.S. Cl. 260—163 **3 Claims**

1. Salts of anionic dyestuffs which contain, as the cation an ammonium ion of a polyhydroxy-amine of the formula



wherein
Y denotes O, NH, NCH_3 or CH_2 and
n denotes a number from 1–5 and
X denotes



4,115,380

PROCESS FOR THE PREPARATION OF DIHYDROXYPHENYLAZOPHENYLAZOPHENYL DYESTUFFS

Hans Jakob Schladetsch, Frankfurt am Main, and Günther Schroth, Muhlheim, Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

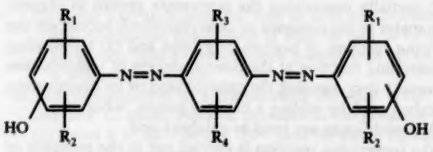
Filed Apr. 19, 1977, Ser. No. 788,763

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617302

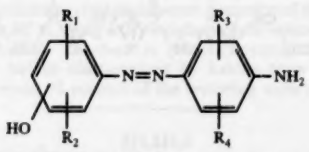
Int. Cl.[2] C09B *31/06*; D06P *1/04, 3/42, 3/54*

U.S. Cl. 260—186 **6 Claims**

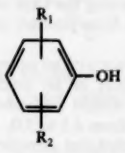
1. Process for the manufacture of a disazo dyestuff of the formula



in which R_1 and R_2 each stand for hydrogen, chlorine, bromine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, R_3 and R_4 each stand for hydrogen, chlorine, bromine, nitro, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and the hydroxyl groups each stand in 2- or 4-position to the azo groups, which comprises diazotizing a 2- or 4-hydroxy-4'- aminoazobenzene of the formula



in which R_1, R_2, R_3 and R_4 are defined as above, with an alkali metal nitrite in an aqueous mineral acid, the normality of which being about 10^{-2} to 5, in the presence of a phenol capable of being coupled of the formula



in which R_1 and R_2 are defined as above and subsequently reacting the diazonium salt obtained with the said phenol by raising the pH to a value between about 3 and 11.

4,115,381
AZO DYESTUFFS HAVING A CARBOXYL GROUP AND AN IMINOSULFONAMIDO, IMINOSULFONYLALKYL OR IMINOSULFONYLARYL GROUP IN THE COUPLING COMPONENT

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

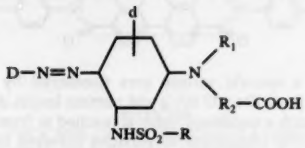
Continuation of Ser. No. 485,054, Jul. 1, 1974, abandoned, which is a continuation of Ser. No. 243,469, Apr. 12, 1972, abandoned. This application Sep. 14, 1976, Ser. No. 723,120

Claims priority, application Switzerland, May 3, 1971, 6468/71

Int. Cl.[2] **C09B** *29/00, 29/08, 29/26;* **D06P** *3/52*

U.S. Cl. 260—207.1 **3 Claims**

1. A dyestuff of the formula



in which

D is phenyl, or phenyl substituted by chloro, bromo, nitro, trifluoromethyl, cyano, methoxy, methyl, sulfonamide, carbomethoxy, N-methylsulfonamide, or methylsulphonyl,

d is hydrogen, methoxy, ethoxy, chloro or methyl,

R_1 is hydrogen, methyl, ethyl, cyanoethyl, hydroxyethyl, acetoxyethyl, methoxyethyl, benzyl, phenylethyl or butyl,

R_2 is methylene, ethylene, propylene, isopropylene or phenylene,

R is methyl, ethyl, propyl, butyl, phenyl, toluyl, dimethylamino or chloromethyl.

4,115,382
3,3-DICHLORO-2-AZETIDINONE DERIVATIVES HAVING BASIC SUBSTITUENTS

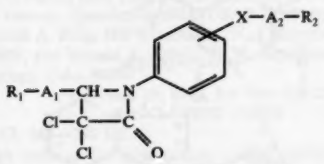
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 6, 1977, Ser. No. 803,827

Int. Cl.[2] **C07D** *205/08;* **A61K** *31/395*

U.S. Cl. 260—239 A **8 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein X is oxygen or sulfur; R_1 is alkyl, cycloalkyl or aryl; R_2 is dialkylamino[, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl or 4-alkyl-1-piperazinyl]; A_1 is a saturated bond or an alkylene group having 1 to 4 carbon atoms; and A_2 is an alkylene group having 2 to 5 carbon atoms; wherein aryl is phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, or nitro group; alkyl and alkoxy are groups having 1 to 6 carbon atoms; and cycloalkyl is a group having 3 to 7 carbon atoms.

4,115,383
ALKOXYCARBONYL-ETHYLTHIO-AZETIDINONES AND PROCESS FOR THEIR PREPARATION

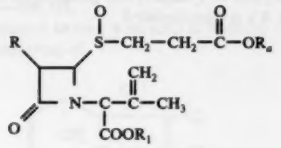
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 660,209, Feb. 23, 1976, abandoned. This application Mar. 24, 1976, Ser. No. 669,938

Int. Cl.[2] **C07D** *705/08;* **A01N** *31/395*

U.S. Cl. 260—239 A **4 Claims**

1. A compound of the formula



in which R_a is C_1–C_4 alkyl;

R_1 is hydrogen or a carboxy protecting group; and

R is

(a) phthalimido;

(b) an amido group of the formula

in which R_2 is

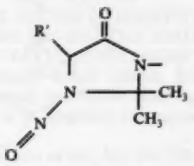
(1) hydrogen, C_1–C_3 alkyl, halomethyl, thienyl2-methyl, 4-protected-amino-4-protected carboxybutyl, benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy;

(2) a group of the formula R'-$(O)_m$-CH_2— in which m is 0 or 1, and R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_3–C_4 alkyl, or C_1–C_2 alkoxy;

(3) a group of the formula

in which R' is as defined above and W is protected hydroxy, protected carboxy, or protected amino; or

(c) an imidazolidinyl group of the formula



in which R' is as defined above.

4,115,384
N-CYANOAZIRIDINES

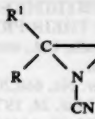
Frank Dennis Marsh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 501,457, Aug. 28, 1974, division of Ser. No. 832,423, Jun. 11, 1969, Pat. No. 3,849,465, which is a division of Ser. No. 383,233, Jul. 16, 1964, Pat. No. 3,510,474. This application May 17, 1976, Ser. No. 687,176

Int. Cl.[2] **C07D** *203/26, 203/02, 203/12*

U.S. Cl. 260—239 E **10 Claims**

1. An N-cyanozairidine of the formula



the R's taken individually are hydrogen or alkyl having up to 18 carbons, and any two of the R groups can be joined together to form an alkylene or cycloalkylene group of up to 14 carbons or one of the R's is trimethylsilyl.

4,115,385

ANTIBACTERIAL 3-(5-TETRAZOLYL) PENAM COMPOUNDS

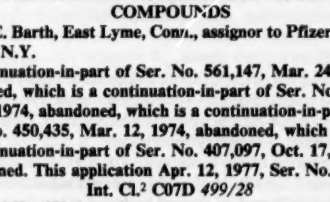
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 561,147, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 491,510, Jul. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 450,435, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 12, 1977, Ser. No. 786,952

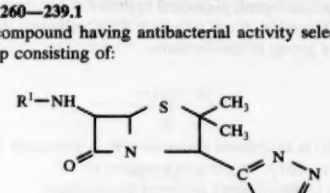
Int. Cl.² C07D *499/28*

U.S. Cl. 260—239.1 **45 Claims**

1. A compound having antibacterial activity selected from the group consisting of:



and



and the salts thereof;

wherein R^1 is an acyl group of an organic carboxylic acid or the acyl group of an acyl derivative selected from the group consisting of esters, amides and chlorides of organic carboxylic acids;

R^3 is selected from the group consisting of hydrogen, trialkylsilyl having from one to four carbon atoms in each of said alkyl groups, alkanoyloxymethyl having from three to eight carbon atoms, 1-(alkanoyloxy)ethyl having from four to nine carbon atoms and 3-phthalidyl;

and R^2 is selected from the group consisting of hydrogen, trialkylsilyl having from one to four carbon atoms in each of said alkyl groups, alkanoyloxymethyl having from three to eight carbon atoms, 1-(alkanoyloxy)ethyl having from four to nine carbon atoms and 3-phthalidyl.

4,115,386

PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID DIIMIDE PIGMENT, ITS MANUFACTURE AND ITS USE

Ludwig Gall, Frankenthal, and Wolfgang Fabian, Wilhelmsfeld, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

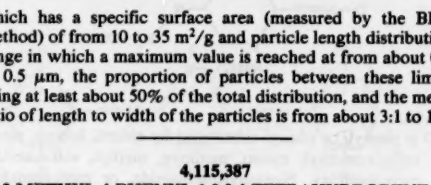
Filed Sep. 22, 1976, Ser. No. 725,394

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545701

Int. Cl.² D06P *1/649*; C07D *471/06*

U.S. Cl. 260—281 P **2 Claims**

1. A particulate perylene-3,4,9,10-tetracarboxylic acid diimide pigment of the formula



which has a specific surface area (measured by the BET method) of from 10 to 35 m^2/g and particle length distribution range in which a maximum value is reached at from about 0.1 to 0.5 μm, the proportion of particles between these limits being at least about 50% of the total distribution, and the mean ratio of length to width of the particles is from about 3:1 to 1:1.

4,115,387

3-METHYL-4-PHENYL-1,2,3,4-TETRAHYDROBENZ [H]ISOQUINOLINE HYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,550

Int. Cl.² C07D *217/02*

U.S. Cl. 260—286 R **1 Claim**

1. The compound 3-methyl-4-phenyl-1,2,3,4-tetrahydrobenz[H]-isoquinoline hydrobromide.

4,115,388

3′-OXYGENATED DERIVATIVES OF 4′-DEOXY VLB "A" AND "B" AND RELATED 1-FORMYL COMPOUNDS

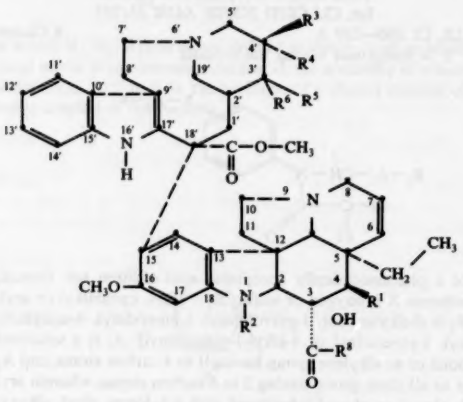
Gerald L. Thompson, and Gloria C. Paschal, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 30, 1977, Ser. No. 782,644

Int. Cl.² C07D *519/04*

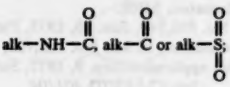
U.S. Cl. 260—287 B **8 Claims**

1. A compound of the formula:



wherein R^1 is OH or acetoxy; R^2 is CH_3 or CHO, one of R^3 and R^4 is hydrogen and the other is ethyl; when taken singly, one of R^5 and R^6 is a β-hydrogen and the other is an α- OR^7 group

and, when taken together, are oxygen; wherein R^7 is hydrogen or



R^8 is OCH_3, NH_2, NH—CH_3, NH—NH_2, N_3, NH—CH_2—CH_2—OH, NH—CH_2—CH_2—Oalk, NH—CH_2—CH_2—SH or NH—CH_2—CH_2—S—alk; and wherein alk is (C_1-C_3) alkyl such that, when R^1 is acetoxy, R^8 is OCH_3, NH_2, NH—CH_3, NH—CH_2—CH_2—Oalk or NH—CH_2—CH_2—S—alk, and pharmaceutically acceptable acid addition salts thereof.

4,115,389

PROCESS OF N-DEMETHYLATING (−)-1-(P-METHOXYBENZYL)-2-METHYL-1,2,3,4,5,6,7,8-OCTAHYDROISOQUINOLINE

Ivo Monkovic, Candiac, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,203

Int. Cl.² C07D *217/20*

U.S. Cl. 260—289 D **3 Claims**

1. The process of N-demethylating (−)-1-(p-methoxybenzyl)-2-methyl-1,2,3,4,5,6,7,8-octahydroisoquinoline which comprises the consecutive steps conducted in one vessel at a temperature in the range of −30° to 50° C. of reacting each mole of said compound in a chlorinated organic solvent selected from the group consisting of methylene chloride, chloroform, carbon tetrachloride, ethylidene chloride and ethylene dichloride with at least one mole of m-chloroperbenzoic acid and then reacting the resulting mixture without isolation of the product therein with 0.01 to 1.0 mole of aqueous ferrous chloride to produce (+)-1-(p-methoxybenzyl)-1,2,3,4,5,6,7,8-octahydroisoquinoline with substantially the same optical purity as that of the starting compound.

4,115,390

METHOD FOR THE PREPARATION OF 1-ALKYL PYRIDINIUM CHLORIDES

John C. Nardi, 3398 Tyler Dr., Brunswick, Ohio 44212; Charles L. Hussey, Quarters 6402H, USAF Academy, Colo. 80840; Lowell A. King, 460 Winters Cir. N., Colorado Springs, Colo. 80919, and Ronald A. Carpio, 21 N. Garland Ave., Colorado Springs, Colo. 80909

Filed Aug. 19, 1977, Ser. No. 826,222

Int. Cl.² C07D *213/04*

U.S. Cl. 260—290 HL **5 Claims**

1. A method for synthesizing 1-alkyl pyridinium chloride which comprises the steps of (1) effecting a reaction within a closed reaction vessel between (A) a liquified alkyl chloride selected from the group consisting of methyl chloride, ethyl chloride, 1-propyl chloride and 1-butyl chloride wherein said alkyl chloride was previously liquified in a cold trap of acetone and (B) 10 percent stoichiometric excess pyridine; (2) continuing said reaction under pressure at a temperature of from room temperature to about 120° C. and for a period of time sufficient to produce said alkyl pyridinium chloride; and (3) washing the product of step (2) in ether, followed by filtering and vacuum drying.

4,115,391

BRIDGEHEAD NITROGEN ANALOGS OF POLY-CHLORINATED CYCLIC HYDROCARBON INSECTICIDES

John Lui Wong, Louisville, Ky., assignor to Research Corporation, New York, N.Y.

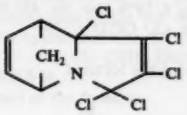
Division of Ser. No. 672,322, Mar. 21, 1976, Pat. No. 4,081,448, which is a continuation-in-part of Ser. No. 454,576, Mar. 25, 1974, abandoned. This application Mar. 16, 1977, Ser. No. 778,114

Int. Cl.² C07D *471/08*

U.S. Cl. 260—290 HL **4 Claims**

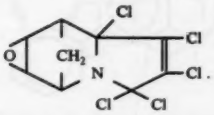
1. A compound having a structural formula selected from the group consisting of:

a)



and hydrogenated. chlorinated and brominated derivatives thereof; and,

b)



4,115,392

MONOFUMARATE SALT OF 3-PYRIDYLMETHYL NICOTINATE

Hideo Kato; Eiichi Koshinaka; Sakae Kurata, and Ikuo Uesaka, all of Fukui, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Fukui, Japan

Filed Oct. 20, 1976, Ser. No. 734,312

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551283

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **1 Claim**

1. Monofumarate of 3-pyridylmethyl nicotinate.

4,115,393

PYRIDYL ALKYL ESTERS OF SUBSTITUTED PHENOXY ALKANOIC ACIDS HAVING THE ABILITY TO REDUCE THE LEVEL OF FATTY SUBSTANCES IN THE BLOOD

Kurt Thiele, Zofingen; Quazi Ahmed, Strengelbach; Rudolf Adrian, Vordemwald, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

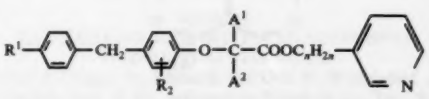
Continuation-in-part of Ser. No. 536,120, Dec. 24, 1974, abandoned. This application Mar. 1, 1977, Ser. No. 773,145

Claims priority, application Switzerland, Mar. 28, 1974, 4355/74; Nov. 18, 1974, 15329/74

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **8 Claims**

1. A compound of the general formula



wherein R^1 and R^2 are hydrogen, halogen, hydroxy or alkyl or alkoxy containing from 1 to 4 carbon atoms;

A^1 and A^2 which can be the same or different are hydrogen or alkyl radical containing up to 10 carbon atoms such that

the total number of carbon atoms in A^1 and A^2 is not more than 10; and

n is an integer of from 1 to 3, and pharmacologically acceptable salts thereof.

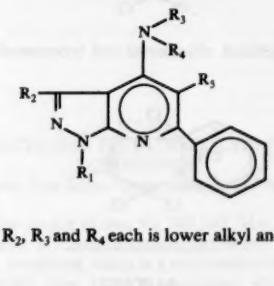
4,115,394

AMINO DERIVATIVES OF 6-PHENYLPYRAZOLO[3,4-b]PYRIDINES

Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 6, 1974, Ser. No. 467,048
Int. Cl.[2] C07D *471/04*
U.S. Cl. 260—296 H **8 Claims**

1. A compound having the formula



wherein R_1, R_2, R_3 and R_4 each is lower alkyl and R_5 is hydrogen.

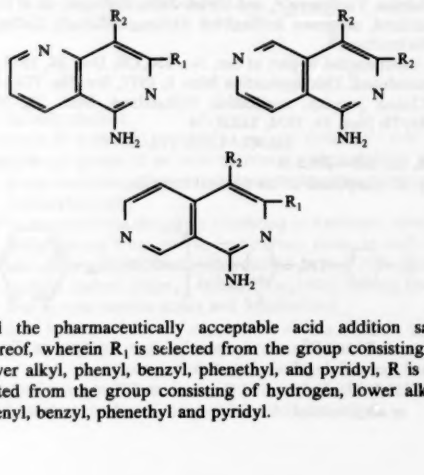
4,115,395

1-AMINONAPHTHYRIDINES

Joseph Mayer, New York, N.Y., and Margaret H. Sherlock, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 631,010, Nov. 12, 1975, Pat. No. 4,017,500, which is a division of Ser. No. 379,525, Jul. 16, 1973, Pat. No. 3,928,367, which is a continuation-in-part of Ser. No. 119,377, Feb. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 816,075, Apr. 14, 1969, abandoned. This application Jan. 26, 1977, Ser. No. 762,605
Int. Cl.[2] C07D *487/02;* A01N *9/22*
U.S. Cl. 260—296 N **5 Claims**

1. Compounds of the formulae:



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is selected from the group consisting of lower alkyl, phenyl, benzyl, phenethyl, and pyridyl, R is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl, phenethyl and pyridyl.

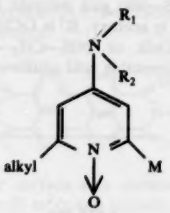
4,115,396

PYRIDINE N-OXIDES

Joseph J. Ursprung, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 588,749, Jun. 20, 1975, Pat. No. 4,067,874, which is a continuation of Ser. No. 165,723, Jul. 23, 1971, abandoned. This application Sep. 9, 1977, Ser. No. 831,753
Int. Cl.[2] C07D *401/04*
U.S. Cl. 260—296 R **7 Claims**

1. A compound of the formula



wherein alkyl is from one to six carbon atoms, inclusive; M is alkyl from one to six carbon atoms, inclusive; $—NH_2$ or

wherein R_3 is hydrogen, alkyl of one to six carbon atoms, inclusive, or alkenyl of from three to six carbon atoms, inclusive, and R_4 is alkyl of one to six carbon atoms, inclusive, or alkenyl of three to six carbon atoms, inclusive, and R_3 and R_4 taken together are alkylene of five to seven carbon atoms, inclusive, said alkylene unsubstituted or substituted with one or more alkyl groups having one to six carbon atoms, inclusive, the total number of carbon atoms in the ring and alkyl groups not to exceed 15, morpholino, thiamorpholino and N-alkyl piperazino, said alkyl having one to three carbon atoms, inclusive; R_1 is hydrogen, alkyl of one to six carbon atoms, inclusive, or alkenyl of three to six carbon atoms, inclusive; R_2 is alkyl of one to six carbon atoms, inclusive, alkenyl of three to six carbon atoms, inclusive; or an acid addition salt thereof.

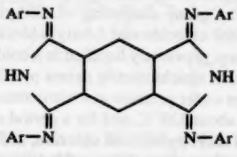
4,115,397

METAL CHELATING LIGANDS

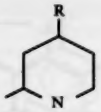
Walter O. Siegl, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 793,587, May 4, 1977. This application Jun. 9, 1977, Ser. No. 805,054
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—296 T **3 Claims**

1. A bis-chelating ligand corresponding to the formula:



wherein each Ar is:



and each R is independently hydrogen or straight or branched chain alkyl of up to about 20 carbon atoms, providing that (a) the sum of the carbon atoms in all R's is at least 8 and (b) no more than one R has a tertiary carbon atom connected to the heterocycle.

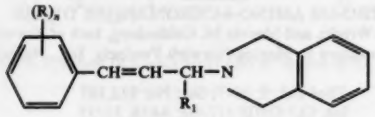
4,115,398

ISOINDOLINE DERIVATIVES AND THE ACID ADDITION SALTS THEREOF AND PROCESS FOR THE PREPARATION OF SAME

Koji Nakamura, Kodaira; Haruo Otaki, Fuji; Yutaka Yamamoto, Higashimurayama; Noboru Shimizu, Higashimurayama; Kiyoshi Kawamura, Higashimurayama, and Seiichi Sato, Higashimurayama, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

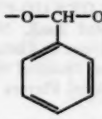
Filed Jan. 5, 1977, Ser. No. 757,028
Int. Cl.² C07D *209/44*
U.S. Cl. 260—326.1 **8 Claims**

1. Isoindoline derivatives of the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof, wherein R represents a moiety selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, nitro, hydroxy and hydroxy lower alkyl, and *n* is a positive number from 1 to 3, which R's may be the same or different when *n* is 2 or 3, and when *n* is 2, the two R's may be joined to two vicinal carbon atoms in the phenyl ring to which the two R's are joined and may taken together form a lower alkylenedioxy group or the group



and R_1 is a member of the group consisting of hydrogen and lower alkyl.

4,115,399

PREPARATION OF CATALYST FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Byron E. Anshus, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 22, 1976, Ser. No. 668,888
Int. Cl.² C07D *207/26*
U.S. Cl. 260—326.5 FN **3 Claims**

1. The process for the production of a mixture of 2-pyrrolidone and a 2-pyrrolidonate salt serving as a catalyst for the anionic polymerization of 2-pyrrolidone, comprising the steps of:

contacting in a reaction zone a hydroxide and excess 2-pyrrolidone to produce a solution of 2-pyrrolidonate and water in 2-pyrrolidone, conducting said solution through an evaporative dehydration zone comprising a thin-film evaporator;

dehydrating said solution under stripping conditions at a temperature of about 75°–150° C. and pressure of about 1–30 mm by flowing a dry inert gas stream countercurrently to the flow of said solution through said thin-film evaporator; and

collecting a bottoms product from said thin-film evaporator containing less than about 0.2 weight percent water, without appreciable loss of 2-pyrrolidone.

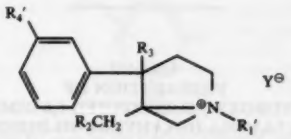
4,115,400

1-AZONIABICYCLO[3.1.0]HEXANES

Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 690,767, May 27, 1976, Pat. No. 4,081,450, which is a continuation of Ser. No. 503,581, Sep. 6, 1974, abandoned. This application Nov. 17, 1977, Ser. No. 852,252
Int. Cl.² C07D *209/52*
U.S. Cl. 260—326.5 B **10 Claims**

1. A compound of the formula



wherein:

R_1' is C_1–C_8 alkyl, C_4–C_8 (cycloalkyl)alkyl, or benzyl;

R_2 is hydrogen, C_1–C_4 alkyl, or C_2–C_6 alkenyl;

R_3 is C_1–C_4 alkyl or C_2–C_6 alkenyl;

R_4' is hydrogen, hydroxy, or C_1–C_3 alkoxy; and

Y^- is a non-nucleophilic anion.

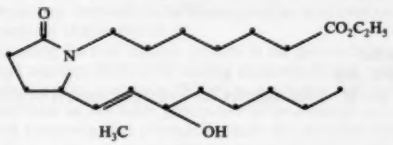
4,115,401

PROSTAGLANDIN DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Souli Nanthavong, Grenoble; Charles Pigerol, Saint-Quen; Pierre Eymard, Fontaine, and Jacques Simiand, Noyarey, all of France, assignors to Labaz, Paris, France

Filed Mar. 31, 1977, Ser. No. 783,284
Claims priority, application Israel, Mar. 31, 1976, 49325
Int. Cl.² C07D *207/12*
U.S. Cl. 260—326.43 **14 Claims**

1. DL-1-hexyl-5-(3'-hydroxy-3'-methyl-1'-octen-(E)-yl)-2-pyrrolidinone of the formula:



in the form of a racemic mixture or the D isomer or L isomer.

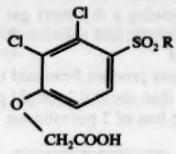
4,115,402

2,3-DICHLORO-4-[(SUBSTITUTED-SULFONYL)-PHENOXY]-ACETIC ACIDS

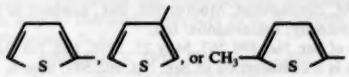
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 17, 1977, Ser. No. 807,478
Int. Cl.² C07D *333/24;* A01N *9/00*
U.S. Cl. 260—332.2 A **4 Claims**

1. A compound of the formula:



where R is



and the non-toxic pharmacologically acceptable acid addition salts, ester and amide derivatives thereof.

4,115,403

PREPARATION OF CIS-1-HYDROXY-3-SUBSTITUTED-6,6-DIMETHYL-6,6A,7,8,10,10A-HEXAHYDRO-9H-DIBENZO [b,d]PYRAN-9-ONES AND INTERMEDIATES THEREFOR

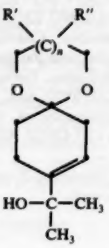
William B. Blanchard, and Charles W. Ryan, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 702,804, Jul. 6, 1976, Pat. No. 4,054,581. This application Jul. 12, 1977, Ser. No. 814,817

Int. Cl.[2] C07D *317/72*

U.S. Cl. 260—340.9 R **2 Claims**

1. A ketal of 4-(1-hydroxy-1-methylethyl)-3-cyclohexen-1-one of the general formula



wherein:

n is 0, and

R′ and R″ independently are hydrogen, methyl or ethyl.

4,115,404

BENZODIFURAN DYESTUFFS

Colin William Greenhalgh; John Laurence Carey, and David Francis Newton, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

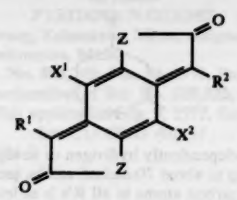
Filed Mar. 1, 1977, Ser. No. 773,229

Claims priority, application United Kingdom, Oct. 3, 1976, 9513/76

Int. Cl.[2] C07D *487/04, 493/04;* **D06P** *1/62, 1/651*

U.S. Cl. 260—343.3 R **1 Claim**

1. A dyestuff which contains a chromophoric system of the formula:



wherein each Z is oxygen;

R^1 and R^2 each independently represent a radical selected from the class consisting of naphthyl, unsubstituted phenyl and phenyl having at least one substituent selected from the class consisting of sulphonic acid, sulphonyl chloride, phenylaminosulphonyl, nitro, lower alkyl, lower alkoxy, halogeno, lower alkoxyphenyl, lower alkoxycarbonyl, amino, lower alkylamino and acetylamino; and

X^1 and X^2 each independently represent a hydrogen atom or a substituent selected from the class consisting of chlorine and bromine atoms and lower alkyl groups.

4,115,405

6-NITRO-OR AMINO-4-CHROMANONE OXIME

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,107

Int. Cl.[2] C07D *311/02;* **A61K** *31/35*

U.S. Cl. 260—345.2 **1 Claim**

1. The compound 6-amino-4-chromanone oxime.

4,115,406

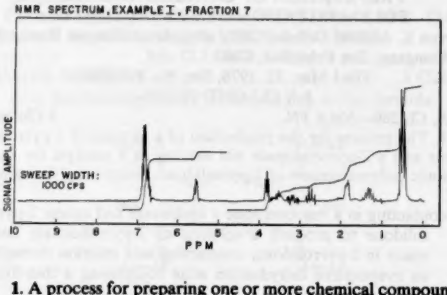
2-ALKYL-4-PHENYL-DIHYDROPYRANS AND PROCESSES FOR AUGMENTING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS AND TOBACCO USING ONE OR MORE OF SAID PYRANS

Joaquin Francisco Vinals, Red Bank, N.J.; Jacob Kiwala, Brooklyn, N.Y.; Denis E. Hruza, Sr., Brick Town, N.J.; John B. Hall, Rumson, N.J., and Manfred Hugo Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

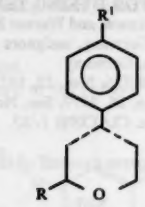
Division of Ser. No. 780,684, Mar. 23, 1977, Pat. No. 4,071,535, which is a division of Ser. No. 676,389, Apr. 12, 1976, Pat. No. 4,071,034. This application Oct. 31, 1977, Ser. No. 847,094

Int. Cl.[2] C07D *309/04*

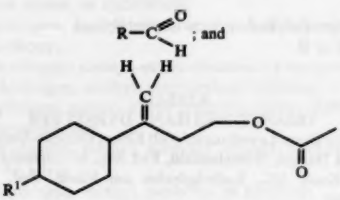
U.S. Cl. 260—345.1 **1 Claim**



1. A process for preparing one or more chemical compounds having the generic structure:



wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and R is one of C_2–C_4 alkyl and R^1 is one of C_1–C_3 alkyl comprising admixing in the presence of a protonic acid catalyst at a temperature in the range of from about 60° C. up to about 120° C. the compounds having the structures:



wherein R is one of C_2–C_4 alkyl and R^1 is one of C_1–C_3 alkyl.

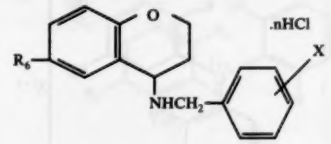
4,115,407

N-BENZYL-4-CHROMANAMINES

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,123
Int. Cl.² C07D *311/02;* A61K *31/35*
U.S. Cl. 260—345.2 **4 Claims**

1. A compound of the formula:



wherein R_6 *is hydrogen or methoxy;* X represents 3-amino, 4-amino or 2-amino-4,5-dimethoxy; and n is 0 or 2.

4,115,408

CONVERSION OF POLY(TETRAMETHYLENE ETHER) GLYCOL IN AQUEOUS EFFLUENT STREAM TO TETRAHYDROFURAN

Melvin Charles Baker, Youngstown, N.Y., assignor to E.I. Du-Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 5, 1977, Ser. No. 822,271
Int. Cl.² C07D *307/08*
U.S. Cl. 260—346.11 **5 Claims**

1. A process for removing poly(tetramethylene ether) glycol from dilute aqueous acidic streams thereof comprising the sequential steps of

(a) maintaining the stream in the liquid phase at a temperature above about 150° C for a period of at least about 15 minutes and

(b) separating tetrahydrofuran therefrom.

4,115,409

ALKANOLAMINE DERIVATIVES

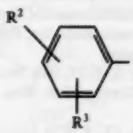
Michael Stewart Large, and Leslie Harold Smith, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 26, 1976, Ser. No. 745,162
Claims priority, application United Kingdom, Dec. 5, 1975, 50039/75
Int. Cl.² C07D *307/54, 333/24*
U.S. Cl. 260—347.3 **6 Claims**

1. An alkanolamine derivative selected from the group consisting of a compound of the formula:

$$R—OCH_2.CHOH.CH_2NH—A—CO—NH—Y—R^1$$

wherein A is alkylene of up to 12 carbon atoms; wherein Y is a direct link, or alkylene of up to 6 carbon atoms or alkyleneoxy of from 2 to 6 carbon atoms; wherein R is aryl of the formula:



wherein R^2 and R^3, may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro, or cyano, alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,7,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; and wherein R^1 is furyl or thienyl; and a non-toxic pharmaceutically-acceptable acid-addition salt thereof.

4,115,410

PROCESS FOR MAKING PEROXYCARBOXYLIC ACID

Herbert L. Watts, Brandenburg, Ky., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 15, 1977, Ser. No. 833,417
Int. Cl.² C07D *301/14;* C07C *179/12*
U.S. Cl. 260—348.25 **18 Claims**

1. In a method of preparing a peroxycarboxylic acid-containing reaction mixture comprising reacting a carboxylic acid with hydrogen peroxide in the presence of an acid catalyst, the improvement characterized by:

eliminating the acid catalyst present in the peroxycarboxylic acid reaction mixture by adding ammonia to said reaction mixture in an amount sufficient to neutralize said catalyst and form an insoluble precipitate in the reaction mixture, and removing said precipitate from the reaction mixture prior to subsequent use of the peroxycarboxylic acid as an oxidant by introducing an underlying aqueous phase beneath said reaction mixture subsequent to introduction of an interface organic solvent barrier layer effective to separate said reaction mixture from said aqueous phase and allowing said precipitate to settle from said reaction mixture through the interface organic solvent barrier layer into the aqueous layer.

16. In a method of preparing an alkylene oxide using a peroxycarboxylic method of indirect oxidation of an alkylene compound comprising reacting a carboxylic acid with hydrogen peroxide in the presence of an acid catalyst to produce a peroxycarboxylic acid reaction mixture and subsequently reacting this reactiion mixture with an unsubstituted, mono-olefinically bonded, lower alkylene to produce an alkylene oxide, the improvement characterized by:

eliminating the acid catalyst present in the peroxycarboxylic acid reaction mixture according to claim 1 by adding ammonia to said reaction mixture in an amount sufficient to neutralize said catalyst and form an insoluble precipitate in the reaction mixture, and removing said precipitate from the reaction mixture, prior to reacting said reaction mixture with the lower alkylene to produce the corresponding alkylene oxide.

4,115,411
CONTINUOUS PROCESS FOR EPOXIDIZING ORGANIC COMPOUNDS CONTAINING OLEFINIC DOUBLE BONDS

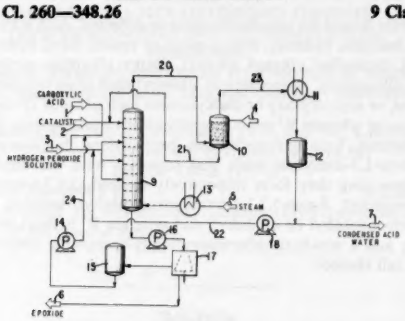
Gerhard Dieckelmann, Hilden; Lutz Jeromin, Düsseldorf-Holthausen, and Günther Tollkötter, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,683

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619091

Int. Cl.[2] C07D *301/16*

U.S. Cl. 260—348.26 **9 Claims**



1. A continuous process for the production of epoxidized olefins which consists essentially of the steps of continuously reacting a mixture consisting of:

(a) an olefinic compound containing at least one olefinic double bond, said compound having at most 30 carbon atoms per double bond and a boiling point at normal pressure of at least 50° C.,

(b) from 0.1 to 1 mol per mol of double bond of said olefinic compound of a carboxylic acid having 1 to 6 carbon atoms and being free of olefinic double bonds,

(c) from 0.001 to 0.01 mol per mol of double bond of said olefinic compound of a water-soluble strong inorganic acid,

(d) from 5 to 7 mols per mol of double bond of said olefinic compound of water, and

(e) sufficient hydrogen peroxide to give during the reaction a peracid content of from 2% to 20% by weight of the aqueous reaction phase,

in a multitray column at a predetermined temperature of from 50° C. to 120° C. and pressures of from 0.1 to 1.1 bar whereby the desired temperature is maintained by water evaporation, wherein said aqueous reaction phase and the gaseous reaction phase are in counterflow, continuously withdrawing the steam from evaporation, continuously withdrawing an aqueous reaction product, separating the epoxidized olefin from the aqueous acid solution, recovering said epoxidized olefin, and continuously recycling said aqueous solution to said reaction, whereby said water content is maintained.

4,115,412
PROCESS FOR DYEING TEXTILES

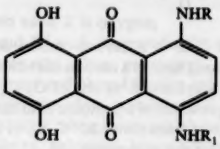
Walter Hohmann, Leverkusen, and Werner Kuhnel, Leverkusen-Steinbuchel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 308,726, Nov. 22, 1972, abandoned. This application Jan. 26, 1977, Ser. No. 762,479

Int. Cl.[2] C09B *1/50*

U.S. Cl. 260—380 **1 Claim**

1. Anthraquinone disperse dyestuff of the formula:



wherein

R is isopropyl, isobutyl, or isopentyl; and

R_1 is H or R.

4,115,413
TRIARYL-METHANE DYESTUFFS

Roderich Raue, Leverkusen; Willi Eifler, Cologne-Stammheim, Ferdinand Dengel, Wilhelmsfeld, Fed Rep. of Germany, assignor to Knoll AG., Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Nov. 21, 1969, Ser. No. 878,952

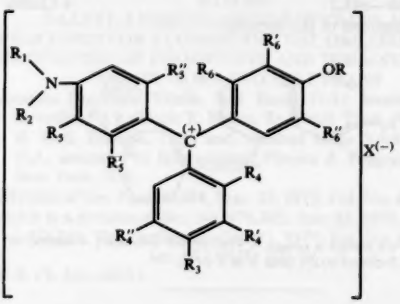
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1968, 1811652; Nov. 28, 1968, 1811336; Nov. 28, 1968, 1811338; Nov. 28, 1968, 1811337

Int. Cl.[2] C07C *93/14*

U.S. Cl. 260—390 **15 Claims**

1. Triaryl methane dyestuff which is free from sulphonic acid and carboxylic acid groups and is selected from the group consisting of dyestuffs having one of the following four formulae:

I.

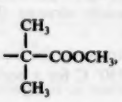


wherein

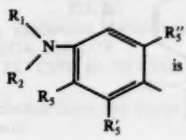
R is a lower alkyl of 1 to 4 carbon atoms, phenyl or cyclohexyl;

R_1 is hydrogen, a lower alkyl of 1 to 4 carbon atoms, hydroxyethyl, hydroxypropyl, methoxyethyl, chloroethyl or benzyl;

R_2 is a lower alkyl of 1 to 4 carbon atoms, hydroxyethyl, hydroxypropyl, methoxyethyl, chloroethyl, cyanoethyl, dimethylaminoethyl,

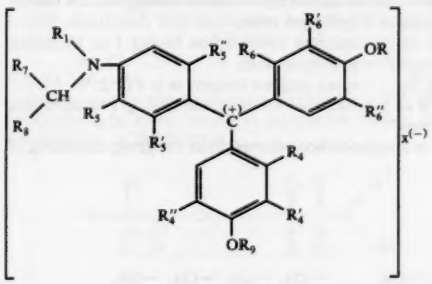


phenyl, ethoxyphenyl, benzyl, or cyclohexyl;
R_1 and R_2, additionally when joined together with the nitrogen atom are
morpholinyl,
3-methylpyrazolinyl,
3-phenylpyrazolinyl; or the radical

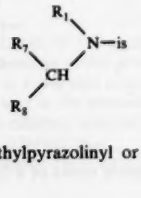


1,2,3,3-tetramethyleneindolinyl, 2-methyl-2,3-dihydroindolyl or tetrahydroquinolinyl;
R_3 is hydrogen, phenoxy, chlorine, lower alkyl of 1 to 4 carbon atoms, or cyclohexyl;
R_4 is hydrogen, methyl, ethyl, isopropyl, chlorine, bromine, or methoxy;
R_4' is hydrogen, methyl, ethyl, chlorine, or methoxy;
R_4'' is hydrogen, methyl, isopropyl, or chlorine;
R_5 is hydrogen, methyl, ethyl, methoxy, ethoxy, hydroxy, or methoxycarbonyl;
R_5' is hydrogen, methyl, methoxy, ethoxy, hydroxy, chlorine, or nitro;
R_5'' is hydrogen, methyl, methoxy, or hydroxy;
R_6 is hydrogen, methyl, methoxy, or chlorine;
R_6' is hydrogen, methyl, ethyl, isopropyl, methoxy, chlorine, or bromine;
R_6'' is hydrogen, methyl, isopropyl, methoxy, or chlorine;
R_4 together with R_4' or R_5 together with R_5', additionally are benzene; and X is the radical of an anion;

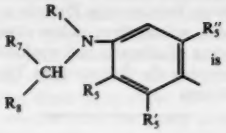
II.



wherein
R is a lower alkyl of 1 to 4 carbon atoms or cyclohexyl;
R_1, R_4, R_4', R_4'', R_5, R_5'', R_6, R_6', R_6'', and X have the above mentioned meaning;
R_7 is hydrogen, methyl, or ethyl;
R_8 is methyl, ethyl, n-propyl, phenyl, or methyl substituted by hydroxy, methoxy, chlorine, cyano, dimethylamino; the radical

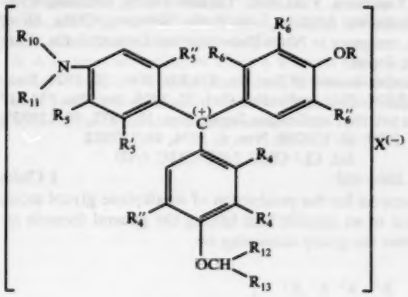


is morpholinyl, 3-methylpyrazolinyl or 3-phenylpyrazolinyl; or the radical



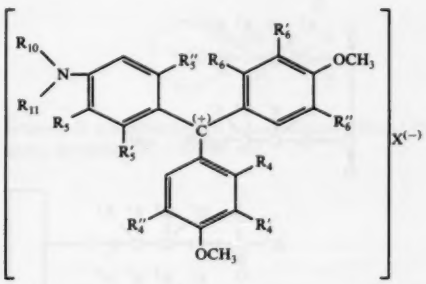
1,2,3,3-tetramethylindolinyl;
R_9 is a lower alkyl of 1 to 4 carbon atoms or cyclohexyl;

III.



wherein
R_4, R_4', R_4'', R_5, R_5', R_5'', R_6, R_6', R_6'', and X have the above mentioned meaning;
R is a lower alkyl of 1 to 4 carbon atoms or cyclohexyl;
R_{10} is hydrogen or methyl;
R_{11} is methyl, phenyl, ethoxyphenyl, or cyclohexyl;
R_{12} is hydrogen, lower alkyl of 1 to 4 carbon atoms or cyclohexyl;
R_{13} is hydrogen or lower alkyl of 1 to 4 carbon atoms;

IV.



wherein
R_{10}, R_{11}, R_4, R_4', R_4'', R_5, R_5', R_5'', R_6, R_6', R_6'' and X, have the above mentioned meaning and wherein at least one of the radicals R_4, R_4', R_5, R_5', R_6 or R_6' is other than hydrogen.

4,115,414

ESTRAMUSTINE PHOSPHATE ALCOHOL COMPLEXES, THEIR PREPARATION, AND THEIR USE AS INTERMEDIATES IN PURIFICATION OF SAID COMPOUND AND SALTS THEREOF

Sten Krister Kristensson, and Anders Robert Stamvik, both of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Sweden

Filed Mar. 3, 1977, Ser. No. 773,911

Claims priority, application United Kingdom, Mar. 10, 1976, 9451/76

Int. Cl.[2] C07J *1/00*

U.S. Cl. 260—397.5 **23 Claims**

1. In a process for the purification of Estramustine Phos-

phate or a salt thereof, the step of forming an alcohol complex thereof by dissolving Estramustine Phosphate in the presence of an alcohol having at least three carbon atoms selected from the group consisting of alkanols and cycloalkanols in liquid phase and precipitating the Estramustine Phosphate alcohol complex from solution.

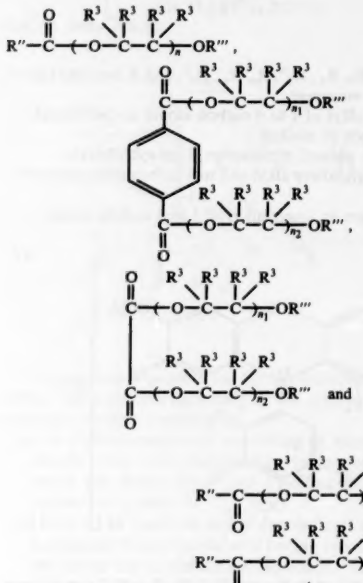
4,115,415

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOL ETHER ESTER OF ORGANIC CARBOXYLIC ACID

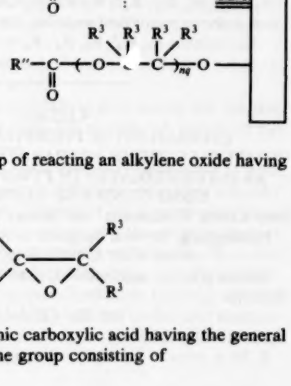
Hiroshi Yoshihara, Yokkaichi; Takashi Tobita, Ichihara; Ryoichi Tomizawa, Ichihara, and Kunio Ishikawa, Chiba, all of Japan, assignors to Nisso Petrochemical Industries Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 524,156, Nov. 15, 1974, Pat. No. 4,022,808. This application Oct. 22, 1976, Ser. No. 734,717
Claims priority, application Japan, Nov. 19, 1973, 48/129938; Nov. 6, 1974, 49/127052
Int. Cl.[2] C09F *5/08*; C11C *3/00*
U.S. Cl. 260—410 **1 Claim**

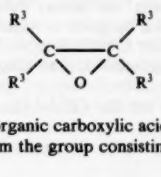
1. A process for the production of an alkylene glycol mono alkyl ester of an organic acid having the general formula selected from the group consisting of:



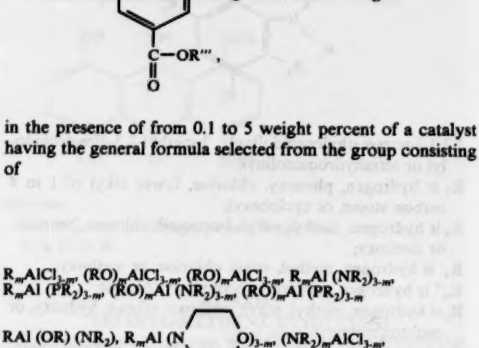
and



which comprises the step of reacting an alkylene oxide having a general formula



with an ester of an organic carboxylic acid having the general formula selected from the group consisting of



in the presence of from 0.1 to 5 weight percent of a catalyst having the general formula selected from the group consisting of

R_mAlCl_{3-m}, $(RO)_mAlCl_{3-m}$, $(RO)_mAlCl_{3-m}$, $R_mAl(NR_2)_{3-m}$, $R_mAl(PR_2)_{3-m}$, $(RO)_mAl(NR_2)_{3-m}$, $(RO)_mAl(PR_2)_{3-m}$

$RAl(OR)(NR_2)$, R_mAl , $(NR_2)_mAlCl_{3-m}$,

$ClAlR(NR_2)$, $ClAl(OR)(NR_2)$, $RAlCl$, and

$ClAl(OR)$

based on the weight of the ester of organic carboxylic acid, wherein

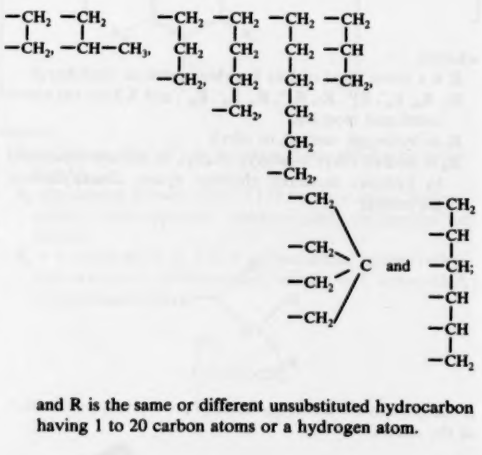
R'' is an unsubstituted hydrocarbon having 1 to 20 carbon atoms or a hydrogen atom;

R^3 is an unsubstituted hydrocarbon having 1 to 10 carbon atoms or a hydrogen atom;

n, n_1, n_2, . . . n_q are positive integer; m is 1 or 2;

R''' is an unsubstituted hydrocarbon having 1 to 20 carbon atoms;

R'''' is a hydrocarbon selected from the group consisting of



and R is the same or different unsubstituted hydrocarbon having 1 to 20 carbon atoms or a hydrogen atom.

4,115,416
PROCESS FOR THE MANUFACTURE OF NEW CARBOXYLIC ACIDS

Alberto Rossi, Oberwil, and Christian Egli, Magden, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

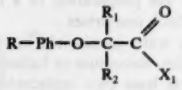
Continuation-in-part of Ser. No. 153,804, Jun. 16, 1971, and Ser. No. 576,397, May 9, 1975, which is a continuation-in-part of Ser. No. 153,804, , which is a continuation-in-part of Ser. No. 98,116, Dec. 14, 1970, abandoned. This application Sep. 9, 1976, Ser. No. 721,737

Claims priority, application Switzerland, May 17, 1974, 6786/74; Oct. 28, 1974, 14402/74

Int. Cl.[2] C07C *69/76;* C11C *1/00*

U.S. Cl. 260—413 **15 Claims**

1. A member selected from the group consisting of compounds of the formula



in which X_1 stands for a member selected from the group consisting of hydroxyl, lower alkoxy and phenyl-lower alkoxy, Ph stands for a member selected from the group consisting of para-phenylene and para-phenylene substituted by a member selected from the group consisting of lower alkyl, halogen and trifluoromethyl, R stands for 1-cycloalkenyl having 6–8 ring carbon atoms R_2 stands for hydrogen and R_1 stands for C_{5-12}-alkyl with straight-chain.

4,115,417
ASYMMETRIC HYDROGENATION CATALYZED BY RHODIUM COMPLEXES OF CHIRAL TERTIARY PHOSPHINES

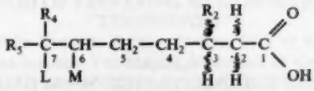
Donald Herman Valentine, Jr., Westfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 623,140, Oct. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,442, Oct. 31, 1974, abandoned. This application Aug. 10, 1977, Ser. No. 823,247

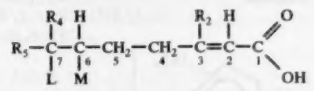
Int. Cl.[2] C11C *3/12;* C07F *9/50;* C07B *1/00*

U.S. Cl. 260—413 **9 Claims**

1. A process for the preparation of optically active alkanoic monocarboxylic acids, having an asymmetric carbon atom at the 3position, of the formula:



wherein R_2 is lower alkyl and R_4 is hydrogen or lower alkyl; R_5 is lower alkyl or lower alkenyl; L and M are hydrogen or may be taken together to form a carbon to carbon double bond and the substituents about said asymmetric carbon atom of alkanoic acid are predominately of the R- or S-configuration; by the enantioselective asymmetric hydrogenation of aliphatic acrylic acids having the formula:



wherein R_2, R_4, R_5, L and M are as defined above, and the double bond at the 2-position of the preceding formula is predominately either cis or trans; said process comprising hydrogenating said acrylic acid in the presence of

(a) a hydrogenation catalyst, wherein said catalyst is a soluble coordination complex of

(i) a rhodium compound selected from the group consisting of μ,μ-dichloro-bis-[cyclooctadiene-rhodium (I)], rhodium trichloride hydrate, rhodium tribromide hydrate, chloro(1,5-hexadiene)rhodium dimer and chloro(bicyclo[2.2.1]hepta-2,5-diene)rhodium dimer; and

(ii) chiral 2-phenyl-2-methoxyethyl-diaryl phosphine, wherein the molar ratio of said phosphine to said rhodium is from about 2:1 to about 10:1;

(b) a solvent selected from the group consisting of lower alkanols and lower alkanols in combination with aromatic hydrocarbons; and

(c) a base selected from the group consisting of alkali metal hydroxides, alkali metal lower alkoxides, lower alkyl amines and cyclic amines.

4. A process according to claim 1 wherein sodium perchlorate is employed as a catalyst stabilizer.

8. A process according to claim 1 wherein said acrylic acid derivative is 3,7,11-trimethyldodeca-2,6,10-trienoic acid.

9. A process according to claim 1 wherein said acrylic acid is 3,7,11-trimethyldodec-2-enoic acid.

4,115,418
1,2-DIAMINOCYCLOHEXANE PLATINUM (II) COMPLEXES HAVING ANTINEOPLASTIC ACTIVITY

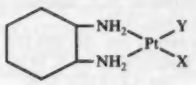
Glen Roy Gale, and Sandra Jan Meischen, both of Charleston, S.C., assignors to Government of the United States of America, Washington, D.C.

Filed Sep. 2, 1976, Ser. No. 719,689

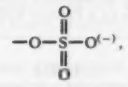
Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 R **5 Claims**

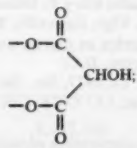
1. An organoplatinum complex having the formula



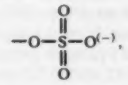
wherein X is a monodentate anionic ligand selected from the group consisting of — ONO_2 and



or together with Y a bidentate anionic ligand of the formula



when X is — ONO_2, Y is — ONO_2 or — OH; and when X is



Y is — $OH_2^{(+)}$.

4,115,419

PROCESS FOR CONVERTING THALLIUM (I) TO THALLIUM (III)

Anthony N. Naglieri, Pine Brook, and Nabil Rizkalla, River Vale, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Apr. 21, 1977, Ser. No. 789,052
Int. Cl.[2] C01F *5/00*
U.S. Cl. 260—429 R **10 Claims**

1. In a process for converting a thallium (I) compound to a thallium (III) compound in which the thallium (I) compound is reacted with an organic hydroperoxide in the presence of a Group VIII noble metal, the improvement which comprises effecting said reaction in the presence of a promotor comprising a member selected from the group consisting of heterocyclic tertiary amines, and compounds of metals of Group IA of the Period Table.

4,115,420

CATALYTIC CONVERSION OF THALLIUM (I) TO THALLIUM (III)

William F. Brill, Skillman, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 740,143, Nov. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 691,115, May 28, 1976, abandoned. This application Apr. 21, 1977, Ser. No. 789,053
Int. Cl.[2] C07F *5/00*
U.S. Cl. 260—429 R **13 Claims**

1. A process for converting a thallium (I) compound to a thallium (III) compound which comprises reacting the thallium (I) compound with molecular oxygen in a liquid medium having a pH of at least about 1 and in the presence of a Group VIII noble metal.

4,115,421

PROCESS FOR CONVERTING THALLIUM (I) TO THALLIUM (III)

William F. Brill, Skillman, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 691,114, May 28, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 740,144
Int. Cl.[2] C07F *5/00*
U.S. Cl. 260—429 R **6 Claims**

1. A process for converting a thallium (I) compound to a thallium (III) compound which comprises reacting the thallium (I) compound with an organic hydroperoxide in a liquid medium in the presence of a Group VIII noble metal.

4,115,422

ANTIBACTERIAL TEXTILE FINISHES UTILIZING ZIRCONYL ACETATE COMPLEXES OF INORGANIC PEROXIDES

Clark M. Welch, Metairie; Gary F. Danna, New Orleans, both of La., and Tyrone L. Vigo, Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 12, 1977, Ser. No. 787,177
Int. Cl.[2] C07F *7/00*
U.S. Cl. 260—429.3 **10 Claims**

1. A process for the preparation of water-insoluble bacteriostatic complexes of zirconyl acetate with hydrogen peroxide, which process comprises:

(a) mixing an aqueous solution containing about from 10% to 30% hydrogen peroxide with a second aqueous solution containing about from 1% to 40% zirconyl acetate, at a mole ratio of about from 0.1 to 3.0 moles of zirconyl acetate per mole of hydrogen peroxide and a temperature of about from 10° C. to 50° C., to cause water-insoluble complexes to precipitate,

(b) filtering the insoluble complexes free of any excess liquid,

(c) washing the insoluble complexes with water to remove excess reagents,

(d) filtering the insoluble complexes, and

(e) drying the insoluble complexes.

4,115,423

PROCESS FOR PRODUCING METAL HALIDE-AMIDE REACTION PRODUCT

Walter T. Bulson; Peter A. Christie, and James R. Jones, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 14, 1976, Ser. No. 723,266
Int. Cl.[2] C07F *7/28*
U.S. Cl. 260—429.5 **18 Claims**

1. A process for the preparation of a metal halide-amide reaction product which comprises

(1) reacting in a water-immiscible inert liquid medium a halide of titanium, zirconium or hafnium with at least one amide having at least two replaceable hydrogen atoms selected from the group consisting of urea, a mono- or di-substituted urea, thiourea, guanidine or semicarbazide, to obtain a reaction product therebetween;

(2) hydrolyzing the reaction product obtained in step (1) above with water to form an aqueous solution of said reaction product;

(3) partially neutralizing the aqueous solution of said reaction product obtained in step (2) with a biacarbonate; and

(4) recovering the metal halide-amide reaction product obtained.

4,115,424

ZEOLITE CATALYST

Mark L. Unland, and George E. Barker, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,041
Int. Cl.[2] B01J *21/02, 27/34, 29/06*
U.S. Cl. 252—432 **12 Claims**

1. A catalyst comprising a crystalline aluminosilicate zeolite of the faugasite structure with SiO_2/Al_2O_3 mole ratio in the range of about 2 to about 8 and including potassium, rubidium or cesium cations or combinations thereof, and containing boron or phosphorus or combinations thereof.

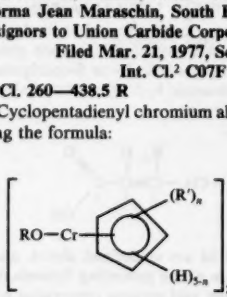
4,115,425

CYCLOPENTADIENYL CHROMIUM OXIDES

Frederick John Karol, Belle Mead, N.J.; Chisung Wu, Beaconsfield, Canada; Walter Thomas Reichle, Warren, and Norma Jean Maraschin, South Bound Brook, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,690
Int. Cl.[2] C07F *11/00*
U.S. Cl. 260—438.5 R **8 Claims**

1. Cyclopentadienyl chromium alkyl/aryl oxides or siloxides having the formula:



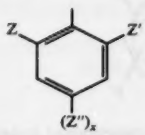
wherein n is an integer having values of 0 to 5, R′ is alkyl having 1 to 10 carbons and R is a monovalent sterically hindered radical selected from the group consisting of:

(1)

wherein each of Y, Y′ and Y″ is alkyl having 1 to 18 carbons or aryl having 6 to 12 carbons,

(2)

wherein Y, Y′ and Y″ are as defined above, and



(3)

wherein Z and Z′ are secondary or tertiary alkyls containing 3 to 5 carbon atoms, Z″ is an alkyl group containing 1 to 6 carbon atoms and x is an integer having values of 0 to 1.

4,115,426

METHOD FOR THE PREPARATION OF DIALKYLCHLOROSILANES

Takeshi Hiiro; Hideki Sakurai, both of Sendai, and Fumihiko Kondo, Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,848

Claims priority, application Japan, Feb. 2, 1977, 52/10373

Int. Cl.² C07F *7/12*

U.S. Cl. 260—448.2 E **8 Claims**

1. A method for the preparation of a dialkylchlorosilane which comprises reducing a dialkyldichlorosilane with sodium borohydride in a solvent capable of dissolving sodium borohydride.

4,115,427

METHOD OF PREPARING SILICON-NITROGEN COMPOUNDS

Hans-Joachim Kotzsch; Rudiger Draese, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 29, 1977, Ser. No. 828,804

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639286

Int. Cl.² C07F *7/10*

U.S. Cl. 260—448.2 E **18 Claims**

1. A process for preparing a silicon-nitrogen compound of the formula

$(R_3Si)_n NR'_{3-n}$ or

$R_2Si(NR'_2)_2$ or RS: $(NR'_2)_3$ or

cyclic $—R_2SiNR'—_x$

wherein

n is 1 or 2 or 3,

R′ is a hydrogen atom, an alkyl moiety of 1 to 8 carbon atoms or an aryl moiety,

R is an alkyl moiety of 1 to 20 carbon atoms or an aryl moiety,

x is 3 or 4

which comprises contacting a hydrogen silane of the formula

$R_{4-y}SiH_y$

wherein y is 1 or 2 or 3 and R has the above described meaning with ammonia or an amine of the formula

$NR'_{3-n}H_n$

wherein R′ and n have the above-described meanings in the presence of a catalyst under conditions wherein hydrogen is split-off.

4,115,428

CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

José Luis Vidal, Charleston, W. Va.; Zoltan Csaba Mester, North Tonawanda, N.Y., and Wellington Epler Walker, Sissonville, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 838,016

Int. Cl.² C07C *27/06, 29/16*

U.S. Cl. 260—449 L **14 Claims**

1. The process of making an alkane polyol (s) which comprises reacting in a homogeneous liquid phase a mixture of hydrogen and oxides of carbon in the presence of a rhodium carbonyl carbido cluster at a pressure between about 4000 to about 16,000 pounds per square inch absolute and at a temperature of between about 240° C. and about 280° C. sufficient to form such alkane polyol.

4,115,429

LOW-TEMPERATURE STORAGE STABLE LIQUID DIPHENYLMETHANE DIISOCYANATES

Helmut F. Reiff, and Richard S. Pantone, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1977, Ser. No. 778,896

Int. Cl.² C07C *119/048*

U.S. Cl. 260—453 SP **18 Claims**

1. A diisocyanate compound which is both stable and liquid at −5° C for at least 48 hours, comprising the reaction product of:

(a) a diphenylmethane diisocyanate containing at least 20 percent by weight of the 2,4′-isomer, and

(b) a polyoxyethylene glycol having a molecular weight of from 150 to 1500.

4,115,430

2-METHYL-3-NITROBENZOIC ACID (2′-CYANOETHYL) ESTER

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 594,471, Jul. 9, 1975, Pat. No. 4,048,217.

This application Jun. 29, 1977, Ser. No. 811,344

Claims priority, application Switzerland, Jul. 15, 1974, 9702/74

Int. Cl.² C07C *121/66*

U.S. Cl. 260—465 D **1 Claim**

1. 2-Methyl-3-nitrobenzoic acid (2′-cyanoethyl) ester.

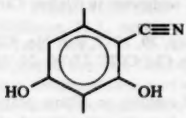
4,115,431

SUBSTITUTED DIMETHYL DIHYDROXY BENZENE AND CYCLOHEXADIENE COMPOUNDS AND USES THEREOF FOR AUGMENTING OR ENHANCING THE TASTE AND/OR AROMA OF CONSUMABLE MATERIALS INCLUDING TOBACCOS, PERFUMES AND PERFUMED ARTICLES

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Frederick Louis Schmitt, Holmdel, and Joaquin F. Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 26, 1977, Ser. No. 800,889
Int. Cl.[2] C07C *121/52*
U.S. Cl. 260—465 F 1 Claim

1. A nitrile compound having the structure:



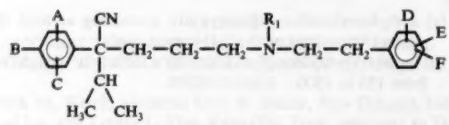
4,115,432

METHOD FOR MAKING BASICALLY-SUBSTITUTED PHENYLACETONITRILES

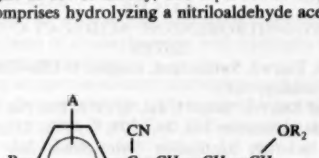
Ferdinand Dengel, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Knoll AG., Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,898
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631222
Int. Cl.[2] C07C *121/78*
U.S. Cl. 260—465 E 2 Claims

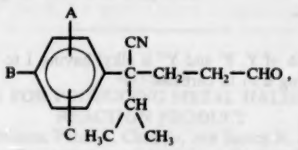
1. A method for making a basically-substituted phenylacetonitrile of the formula



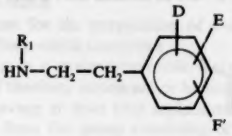
wherein A, C, D, E, F are hydrogen, halogen, or lower alkoxy, B is halogen or lower alkoxy, and R_1 is lower alkyl, which method comprises hydrolyzing a nitriloaldehyde acetal of the formula



wherein A, B and C have their aforementioned meanings and R_2 is lower alkyl, with aqueous acid to obtain a nitriloaldehyde of the formula



and then subjecting said nitriloaldehyde to a hydrogenating condensation with an amine of the formula



wherein D, E, F and R_1 have their aforementioned meanings.

4,115,433

CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

Lowell Alan Cosby; Rocco Anthony Fiato, and Jose Luis Vidal, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,866
Int. Cl.[2] C07C *27/06, 29/16*
U.S. Cl. 260—449 L 17 Claims

1. The process of making an alkane polyol(s) which comprises reacting in a homogeneous liquid phase a mixture of hydrogen and oxides of carbon in the presence of a rhodium carbonyl sulfur cluster compound at a pressure between about 1,000 to about 50,000 pounds per square inch absolute and at a temperature of between about 210° C. and about 320° C. sufficient to form such alkane polyol(s).

4,115,434

CATALYSTS AND PROCESSES FOR PREPARING UNSATURATED NITRILES

Jacques Marion, and Christian Pralus, both of Lyons, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 22, 1977, Ser. No. 789,869
Int. Cl.[2] B01J *23/84;* C07C *120/02*
U.S. Cl. 260—465.3 14 Claims

1. A catalyst for the production of unsaturated nitriles by ammoxidation of olefins, the catalyst consisting essentially of a combination of the oxides of antimony, tin, zirconium, copper, and tungsten according to the formula:

$$Sb_a Sn_b Zr_c Cu_d W_e O_f$$

where a is from 1 to 10, b is from 1 to 10, c is 1, d is from 0.01 to 5, e is from 0.01 to 0.05, and f is the number of oxygen atoms in combination with the oxygenated compounds.

6. A process for the ammoxidation of olefins to produce the corresponding nitriles, which process comprises contacting a gaseous mixture of the olefin, an oxygen-containing gas, and ammonia with the catalyst of claim 1 to convert the olefin to the nitrile, and recovering the nitrile so produced.

4,115,435
BISULFITE TERMINATED OLIGOMERS AS DISPERSING AGENTS

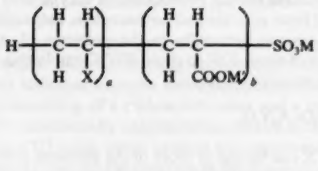
John T. O'Brien, Cheshire, and Woodrow W. White, Oxford, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 493,382, Jul. 31, 1974, Pat. No. 4,004,939, which is a continuation-in-part of Ser. No. 456,397, Mar. 29, 1974, abandoned. This application Sep. 23, 1976, Ser. No. 726,034

Int. Cl.[2] C07C *121/38, 143/12, 143/02*

U.S. Cl. 260—465.4 2 Claims

1. A dispersing agent for solid particulate matter in an aqueous system consisting of an oligomer having the general formula



wherein M is a sodium cation; X is selected from the group consisting of —CN and —$COOCH_3$; M′ is a sodium cation; $a + b$ is about 4 to about 250 and $a/a+b$ is 0.0.

4,115,436
PROCESS FOR PRODUCING AMMONIUM P-STYRENESULFONATE

Kanzi Katsuragawa; Tatsuo Hattori; Keiichi Kihara, and Hanzo Tamabayashi, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 608,701, Aug. 28, 1975, Pat. No. 4,061,669. This application Jul. 8, 1977, Ser. No. 813,846

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.[2] C07C *143/24*

U.S. Cl. 260—505 N 4 Claims

1. A process for producing ammonium p-styrenesulfonate which comprises reacting an amine having more than 7 carbon atoms and less than 600 MW, and a mineral acid or a mineral acid salt of an amine having more than 7 carbon atoms and less than 600 MW with an alkali metal p-styrenesulfonate in an aqueous or an aqueous organic solvent to produce an amine salt of p-styrenesulfonic acid as a precipitate in said aqueous solvent or a solution in said aqueous organic solvent and then reacting ammonia with said amine salt as the precipitate or the solution.

4,115,437
SULFONATED PRODUCT OF BUTADIENE OR ISOPRENE OLIGOMER AND THE PRODUCTION THEREFOR

Yoshinobu Matsuda, Ibaraki; Yukio Suzuki, Toyonaka, and Seimei Yasui, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

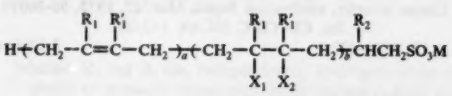
Filed Sep. 15, 1977, Ser. No. 833,654

Claims priority, application Japan, Oct. 28, 1976, 51-130135; Nov. 11, 1976, 51-135934

Int. Cl.[2] C07C *143/16;* C11D *1/14*

U.S. Cl. 260—513 R 8 Claims

1. A compound of the formula:



wherein one of R_1 and R_1' is hydrogen or methyl and another one is hydrogen; R_2 is hydrogen or methyl; one of X_1 and X_2 is —SO_3M and another one is hydrogen; a and b are each an integer satisfying the conditions: $n = a + b$, $2 \leqq n \leqq 40$ and $0 \leqq b$; M is hydrogen, Na, K, Li or —$NR_3R_4R_5R_6$; and R_3, R_4, R_5 and R_6 are each hydrogen or an alkyl having 1 to 6 carbon atoms.

4,115,438
BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS 11-DEOXY-PGE$_2$ ACIDS AND ESTERS

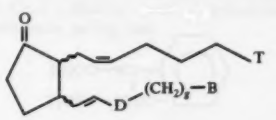
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 657,221, Feb. 11, 1976, Pat. No. 4,073,463. This application Jul. 21, 1977, Ser. No. 817,622

Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—498 7 Claims

1. A compound having the formula



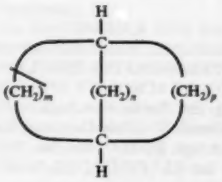
wherein:

g is an integer having a value of from 0 to 10;

D is a R-hydroxymethylene or S-hydroxymethylene radical;

T is an alkoxycarbonyl having from 1 to 3 carbon atoms inclusive in the alkyl chain, carboxyl or pharmacologically acceptable nontoxic carboxy salts; and

B is a bicycloalkyl radical of the formula



where m and p are integers having a value of from 1 to 4; n is an integer having a value of from 0 to 4 such that n is not 1 when m and p are both 2; and the sum of m, n and p is greater

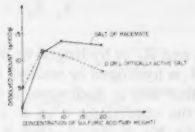
than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

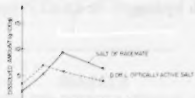
4,115,439

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE α-PHENYLGLYCINE AND INTERMEDIATES THEREOF

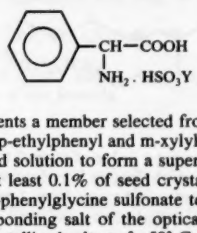
Shigeru Aoki, Tokyo; Yasuhisa Tashiro, Yokohama; Yuzo Aboshi, Tokyo; Toshiro Narita, Shima, and Tadashi Shirai, Musashino, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1976, Ser. No. 670,420
Claims priority, application Japan, Mar. 27, 1975, 50-36070
Int. Cl.[2] C07C *101/04, 143/26*
U.S. Cl. 562—402 **3 Claims**





1. A process for producing optically active α-phenylglycine which comprises dissolving a DL-α-phenylglycine sulfonate having the general formula:



wherein Y represents a member selected from the group consisting of phenyl, p-ethylphenyl and m-xylyl in a 1 wt % to 50 wt % sulfuric acid solution to form a supersaturated solution thereof, adding at least 0.1% of seed crystals of an optically active D- or L-α-phenylglycine sulfonate to selectively crystallize the corresponding salt of the optically active isomer, separating the crystallized salt at 0° -50° C, and liberating the sulfonic acid portion from the salt to obtain the optically active isomer.

4,115,440

SELENIUM CATALYZED DECOMPOSITION OF PEROXIDE INTERMEDIATES RESULTING FROM THE AUTOXIDATION OF ACROLEIN AND METHACROLEIN

Ming Nan Sheng, and Jar-lin Kao, both of Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 19, 1977, Ser. No. 788,722
Int. Cl.[2] C07C *51/32, 57/04*
U.S. Cl. 562—533 **17 Claims**

1. A process for the preparation of acrylic acid or methacrylic acid which comprises catalytically decomposing at a temperature in the range of from about 0° C. to about 100° C. in the presence of a selenium catalyst selected from the group consisting of elemental selenium, selenium dioxide, trioxide, sulfide, disulfide, chloride, oxychloride and bromide, selenious acid, selenic acid, aluminum selenide, sodium selenide, sodium selenite, sodium selenate, diethylselenite, diethyldiselenide, dioctylselenide, dioctyldiselenide, diphenylselenide, diphenyldiselenide and phenylseleninic acid, or mixtures thereof, the corresponding peracrylic acid and acrolein monoperacrylate or permethacrylic acid and methacrolein monopermethacrylate intermediate peroxide compounds formed during the liquid phase autoxidation of acrolein or methacrolein, or contained in an oxidate solution derived from and after said liquid phase autoxidation, and recovering the acrylic or methacrylic acid.

4,115,441

CATALYST COMPOSITIONS ESPECIALLY USEFUL FOR PREPARATION OF UNSATURATED ACIDS

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 686,352, May 14, 1976. This application Dec. 30, 1976, Ser. No. 755,708
Int. Cl.[2] C07C *57/04*
U.S. Cl. 562—534 **8 Claims**

1. The process for the production of acrylic acid or methacrylic acid from acrolein and methacrolein, respectively, with molecular oxygen optionally in the presence of steam at a temperature of about 200° to about 500° C employing a catalyst having the empirical formula:

$$Mo_aV_bGe_cX_dY_eO_f$$

wherein X can be one or more of the elements selected from the group consisting of iron, nickel, thallium, phosphorus, indium, bismuth, and the rare earths; and

Y can be one or more of the elements of the group consisting of copper, tin, chromium, manganese, magnesium, aluminum, titanium, arsenic, niobium, tantalum, potassium, rubidium, cesium, tungsten, uranium, cobalt, silver, gallium, antimony, and zinc; and

wherein the number of atoms of each element present is represented by *a* through *f*,

wherein

a is a number from 6 to 18;

b is a number from 0.1 to 10;

c is a number from 0.1 to 6;

d is a number from 0.01 to 5;

e is a number from 0 to 5;

f is a number that satisfies the valence requirements of the other elements present.

4,115,442

OXIDATION OF BUTENE

William E. Slinkard, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,353
Int. Cl.[2] C07C *51/32*
U.S. Cl. 562—548 **10 Claims**

1. A process for the production of acetic acid by vapor phase oxidation of a butene comprising reacting, in the vapor phase and at elevated temperatures, said butene with molecular oxygen in the presence of a catalyst consisting essentially of a composition of the empirical formula:

$$V_aCe_bMe_cO_d$$

in which formula V is vanadium, Ce is cerium, O is oxygen, and Me is at least one member selected from the group consisting of bismuth, zinc, tin and titanium, and wherein the atomic ratio of the elements in said composition is such that when *a* is 10, *b* is from about 2 to 15, *c* is from about 2 to 15, *d* is a number of at least 20 such that the valence requirements of V, Ce and Me are satisfied, and the sum of *b* and *c* does not exceed about 20.

4,115,443
PROCESS OF MAKING D,L-LITHIUM PANTOATE AND RESOLVING THE RACEMIC MIXTURE INTO ITS OPTICALLY ACTIVE ISOMERS

Joachim Schmidt; Christian Weigelt; Wolfgang Bamberg, and Wolfgang Schneider, all of Jena, Democratic Rep. of Germany, assignors to Veb Jenapharm, Jena, Democratic Rep. of Germany

Continuation of Ser. No. 540,249, Jan. 10, 1975, abandoned, which is a division of Ser. No. 407,254, Oct. 17, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,437
Int. Cl.² C07C *59/04*
U.S. Cl. 562—402 **4 Claims**

1. Optically active D-lithium pantoate.

4,115,444
PROCESS FOR PREPARING CARBOXYLIC ACID ANHYDRIDES

Nabil Rizkalla, River Vale, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 556,750, Mar. 10, 1975. This application Feb. 5, 1976, Ser. No. 654,661
Int. Cl.² C07C *53/12, 53/26, 63/04*
U.S. Cl. 260—549 **26 Claims**

1. In a process for the preparation of an anhydride of a monocarboxylic acid by reacting carbon monoxide, a halide which is an iodide or bromide and a compound selected from the group consisting of a carboxylate ester and a hydrocarbyl ether, under substantially anhydrous conditions in the presence of a Group VIII noble metal catalyst the improvement which comprises carrying out the reaction in the presence of a multiple promoter comprising (1) at least one metal of Group VIB or a non-noble metal of Group VIII and (2) an organo-nitrogen compound or an organo-phosphorus compound wherein the nitrogen and the phosphorus are trivalent.

4,115,445
PROCESS FOR THE PREPARATION OF TRISUBSTITUTED UREAS

Colin John Hearsey, Surbiton, England, assignor to Quimco GmbH, Zurich, Switzerland

Division of Ser. No. 346,480, Mar. 30, 1973, Pat. No. 3,911,006. This application Feb. 12, 1975, Ser. No. 549,146
Claims priority, application United Kingdom, Apr. 5, 1972, 15677/72; Apr. 18, 1972, 17872/72; May 5, 1972, 21063/72
Int. Cl.² C07C *127/15*
U.S. Cl. 260—553 A **4 Claims**

1. A one-step process for preparing a trisubstituted urea of the formula

$$R(NHCONR'R'')_n$$

which comprises reacting a compound having the formula

which comprises reacting a compound having the formula

$$R(NO_2)_n$$

with a secondary amine of the formula

$$R'R''NH$$

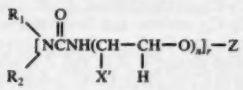
and carbon monoxide and sulfur or carbonyl sulfide at super atmospheric pressure in an inert solvent at a temperature within the range 80°–200° C., wherein R is an unsubstituted mono, di- or polyvalent aromatic radical or is substituted only with groups which are non-reactive under the reaction conditions, R′ and R″ are monovalent aliphatic radicals or R′ and R″ together represent a divalent aliphatic radical, and n is an integer.

4,115,446
POLYETHER POLYUREIDES

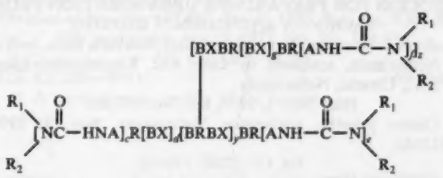
Heinz Schulze, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,879
Int. Cl.² C07C *127/15;* C08G *65/32*
U.S. Cl. 260—553 R **15 Claims**

1. A polyether polyureide comprising a substituted ureido-terminated polyoxyalkylene selected from the group consisting of a compound of the formula:



wherein R_1 and R_2 are, independently, hydrogen or an aliphatic or aromatic monovalent hydrocarbon radical, provided at least one R_1 or R_2 is not hydrogen; X′ is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon radical having 2 to 5 carbon atoms forming from 2 to 4 external ether linkages; n is a number from 1 to about 20; and, r is a number from 2 to 4; and a compound of the formula:



wherein R_1 and R_2 are as defined above; A is a polyoxyalkylene radical containing from about 1 to 17 oxyalkylene groups; B is a polyoxyalkylene amino radical containing from about 1 to 17 oxyalkylene groups; R is a hydrocarbon radical having from 2 to 5 carbon atoms and forming from 2 to 4 oxycarbon linkages with A and B; X is a C═O radical, a C═S radical or a radical derived from a difunctional isocyanate having two

groups; c and d are from 1 to 3 chosen such that their sum is from 1 to 4; e is a number from 1 to 3, f is a number from 1 to 3, g is a number from 1 to 3, y is a number from 0 to about 5, and z is a number from 0 to 2.

4,115,447
CARBAMYLGUANIDINE ANTIMICROBIAL COMPOUNDS

Julius Diamond, Morris Plains, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Division of Ser. No. 546,549, Feb. 3, 1975, Pat. No. 4,022,962. This application Jan. 7, 1977, Ser. No. 757,577
Int. Cl.² C07C *127/15;* A61K *31/17*
U.S. Cl. 260—553 R **14 Claims**

1. A compound having the formula Z—B—Y—B′—Z .nHA wherein Y is a bivalent organic radical selected from the group consisting of C_2–C_{12} alkylene, C_5–C_{12} cycloalkylene, C_5–C_{12} cycloalkylenebis(loweralkyl), C_6–C_{12} arylene and loweralkylarylene, C_7–C_{12} arylenealoweralkyl, and C_8–C_{12} arylenebis(loweralkyl); B is a carbamylguanidino group; B′ is B; and Z is selected from the group consisting of C_1–C_{12} alkyl; C_3–C_{12} alkenyl; C_3–C_{12} alkynyl; C_3–C_{12} cycloalkyl, C_4–C_{12} cycloalkylalkyl; and pharmacologically acceptable addition salts of these compounds with acids represented by nHA wherein n=0, ½, ⅓, ¾, 1, and 2 and HA is an inorganic or organic acid.

4,115,448
CARBAMYLGUANIDINE ANTIMICROBIAL COMPOUNDS

Julius Diamond, Morris Plains, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Division of Ser. No. 546,549, Feb. 3, 1975, Pat. No. 4,022,962. This application Jan. 7, 1977, Ser. No. 757,600

Int. Cl.[2] C07C *127/19;* A61K *31/35*

U.S. Cl. 260—553 A 10 Claims

1. A compound having the formula Z—B—Y—B′—Z .*n*HA wherein Y is a bivalent organic radical selected from the group consisting of C_5–C_{12} cycloalkylene, C_5–C_{12} cycloalkylenebis (loweralkyl), C_6–C_{12} arylene and loweralkylarylene, C_7–C_{12} arylenealoweralkyl, and C_8–C_{12} arylenebis (loweralkyl); B is a carbamylguanidino group; B′ is B; and Z is selected from the group consisting of C_6–C_{14} aryl; C_7–C_{14} aralkyl and C_6–C_{14} aryl and aralkyl substituted with one or more radicals selected from the group consisting of loweralkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, loweralkylthio, halo, loweralkylsulfonyl, fluorosulfonyl and alkylsulfinyl; and pharmacologically acceptable addition salts of these compounds with acids represented by nHA wherein $n=0$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, 1, and 2 and HA is an inorganic or organic acid.

4,115,449
PROCESS FOR PREPARING A UREA SOLUTION FROM AMMONIA AND CARBON DIOXIDE

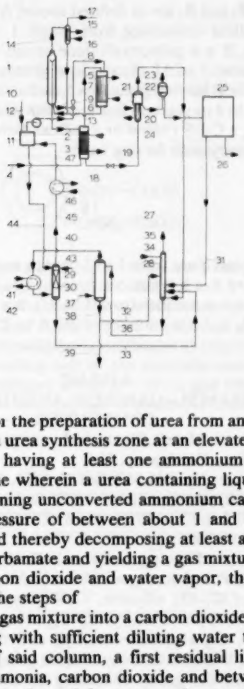
Andreas J. Biermans, Urmond, and Kees Jonckers, Born, both of Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed Nov. 1, 1977, Ser. No. 847,653

Claims priority, application Netherlands, Nov. 3, 1976, 7612162

Int. Cl.[2] C07C *126/02*

U.S. Cl. 260—555 A 6 Claims



1. In a process for the preparation of urea from ammonia and carbon dioxide in a urea synthesis zone at an elevated temperature and pressure, having at least one ammonium carbamate decomposition zone wherein a urea containing liquid process stream, also containing unconverted ammonium carbamate, is expanded to a pressure of between about 1 and 25 kg/cm^2 absolute and heated thereby decomposing at least a portion of said ammonium carbamate and yielding a gas mixture containing ammonia, carbon dioxide and water vapor, the improvement comprising the steps of

introducing said gas mixture into a carbon dioxide separation column, along with sufficient diluting water to form, in the bottom of said column, a first residual liquid phase containing ammonia, carbon dioxide and between about 65 and 96 percent by weight water, and separately removing therefrom a first off-gas of carbon dioxide substantially free of ammonia, and said first residual liquid phase, introducing said first residual liquid phase into a desorption column and separately removing therefrom a second off-gas containing ammonia, carbon dioxide and water vapor, and a second residual liquid phase containing water substantially free of ammonia and carbon dioxide,

introducing said second off-gas into an ammonia separation column and separately removing therefrom a third off-gas of ammonia substantially free of carbon dioxide and water vapor and a third residual liquid phase containing ammonia, carbon dioxide and water, and

recycling said third off-gas to said urea synthesis zone, and introducing said third residual liquid phase into said carbon dioxide separation column, the water content of such third residual liquid phase constituting a portion of said diluting water,

wherein said ammonia separation column, desorption column and carbon dioxide separation column are all operated at substantially the same pressure of between about 1 and 25 kg/cm^2 absolute.

4,115,450
BIS-AMINOARYLETHANE AMIDE COMPOUNDS

Robert Garner, Bury, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

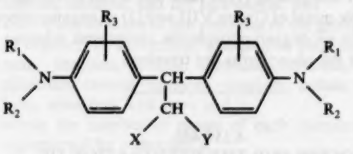
Division of Ser. No. 651,107, Jan. 21, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 773,988

Claims priority, application Switzerland, Jan. 27, 1975, 950/75

Int. Cl.[2] C07C *103/28, 103/76*

U.S. Cl. 260—558 A 5 Claims

1. A bis-aminoarylethane compound of the formula



(I)

wherein

R_1 and R_2, which can be the same or different, represent hydrogen, alkyl of at most 12 carbon atoms which is unsubstituted or substituted by halogen, alkoxyalkyl of 2 to 8 carbon atoms, benzyl or phenyl,

R_3 represents hydrogen, halogen, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

each of X and Y independently represents carboxy anilide groups whose benzene nuclei are unsubstituted or substituted by halogen, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

Y is also alkyl of 1 to 4 carbon atoms, acyl of 2 to 8 carbon atoms or phenyl.

4,115,451
BENZENE-1,3,5-TRIS-ACETOXIME AND THE PROCESS FOR MAKING PHLOROGLUCINOL THEREWITH

Hans Zengel, Kleinwallstradt, and Manfred Bergfeld, Erlenbach, Main, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 796,109, May 12, 1977, Pat. No. 4,071,555. This application Aug. 11, 1977, Ser. No. 823,789

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621431

Int. Cl.[2] C07C *131/00*

U.S. Cl. 260—566 A 2 Claims

1. A process for making benzene-1,3,5-tris-acetoxime comprising reacting s-triacetyl benzene with hydroxylamine hydrochloride at a molar ratio of the hydrochloride to s-triacetyl benzene of about 3 to 1, in the presence of a metal hydroxide selected from the group consisting of alkali metal hydroxides

and alkaline earth hydroxides, the metal hydroxide being present at a molar ratio of said hydroxide to s-triacetyl benzene of about 3 to 1, in a solvent selected from the group consisting of ethylene glycol, diethylene glycol, butanediol-1,4, propane diol and glycerin, and at a temperature of from about 70° to about 170° C, for a length of time sufficient to form a substantial amount of benzene-1,3,5-tris-acetoxime.

4,115,452

4,5, SUBSTITUTED CYCLOPENTANE-1,3-DIOLS

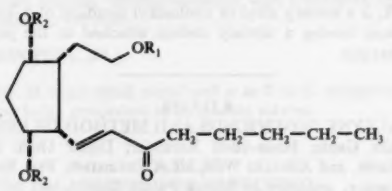
Naresh Kumar Chadha, Nutley; John Joseph Partridge, Jr., and Milan Radoje Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 623,205, Oct. 16, 1975, abandoned, which is a division of Ser. No. 434,539, Jan. 18, 1974, Pat. No. 3,933,382, which is a division of Ser. No. 331,931, Feb. 12, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,732

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—586 R **2 Claims**

1. An optically active compound of the formula



wherein $-OR_1$ forms a conventional hydrolyzable ether protecting group convertible to hydroxy by hydrolysis and $-OR_2$ forms hydroxy or hydroxy protected by a conventional ester group convertible to hydroxy by hydrolysis

or its optically active antipode.

4,115,453

BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS PGE_1 ALCOHOLS

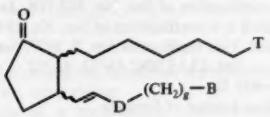
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 657,221, Feb. 11, 1976, Pat. No. 4,074,063. This application Jul. 22, 1977, Ser. No. 818,057

Int. Cl.[2] C07C *49/46*

U.S. Cl. 260—586 G **5 Claims**

1. A compound having the formula



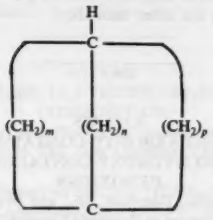
wherein

g is an integer having a value of from 0 to 10;

D is a R-hydroxymethylene or S-hydroxymethylene radical;

T is a hydroxymethyl radical; and

B is a bicycloalkyl radical of the formula



where *m* and *p* are integers having a value of from 1 to 4; *n* is an integer having a value of from 0 to 4 such that n is not 1 when *m* and *p* are both 2; and the sum of m, n and p is greater than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

4,115,454

2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENYL-PGD_1 COMPOUNDS

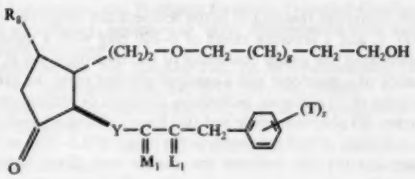
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,024

Int. Cl.[2] C07C *49/84*

U.S. Cl. 260—590 C **39 Claims**

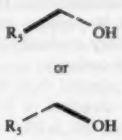
1. A prostaglandin analog of the formula



wherein R_8 is hydrogen or hydroxy;

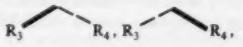
wherein Y is trans-CH=CH-;

wherein M_1 is

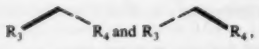


wherein R_5 is hydrogen or methyl;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein *g* is one, 2, or 3; and

wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's

being the same or different, with the proviso that not more than two T's are other than alkyl.

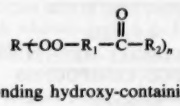
4,115,455

REDUCTION OF CARBONYL-CONTAINING DIALKYL PEROXIDES TO HYDROXY-CONTAINING DIALKYL PEROXIDES

Wilbur H. McKellin, Deerfield, Ill., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

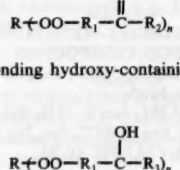
Filed Sep. 15, 1976, Ser. No. 723,415
Int. Cl.[2] C07C *179/06*
U.S. Cl. 260—610 R **13 Claims**

1. A process of reducing carbonyl-containing dialkyl peroxide of the formula



(II)

to the corresponding hydroxy-containing dialkyl peroxide of the formula



(I)

which comprises reacting II in the temperature range of −20° to 100° C and a pressure range of 0–200 psig with a member selected from the group consisting of (A) hydrogen gas in the presence of a promoter and a catalyst selected from the group consisting of (i) platinum, palladium, rhodium or ruthenium on a carrier, (ii) platinum oxide and (iii) Raney nickel wherein the concentration of said catalyst is in the range of 0.5–30% on the carrier and 0.1–3% without the carrier and (B) a hydride selected from the group consisting of an alkali metal aluminum hydride and an alkali metal borohydride wherein the hydride to peroxide ratio is in the range of 1 mole to 0.5–4 moles, wherein:

n is 1 to 3 with provisos (a) through (n) below:

a. when *n* is 1, R is selected from the group consisting of tertiary alkyl of 4–10 carbons, tertiary bicycloalkyl of 8–10 carbons, tertiary cycloalkyl of 6–10 carbons and tertiary aralkyl of 9 carbons;

b. when *n* is 2, R is selected from the group consisting of ditertiary alkylene diradical of 8–20 carbons, ditertiary alkynylene diradical of 8–20 carbons, and ditertiary aralkylene diradical of 12 carbons;

c. when *n* is 3, R is selected from the group consisting of tri-tertiary alkyl triradical of 10–21 carbons and tri-tertiary-aralkyl triradical of 15 carbons;

d. R_1 is a tertiary alkyl or cycloalkyl diradical of 3–15 carbons having the tertiary carbon attached to the peroxy oxygen;

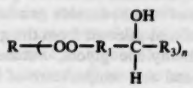
e. R_2 and R_3 are selected from the group consisting of —R_1—OO—R, alkyl of 1–15 carbons, cycloalkyl of 3–15 carbons, and hydrogen; R_2 can also be selected from the group consisting of a hydroxyl and lower alkoxy of 1–5 carbons;

f. R_1 can be linked with R_2 or R_3 to form a cycloalkyl triradical of 3–10 carbons;

g. when *n* is 1, R can be linked to R_1 to form an alkyl triradical of 6–20 carbons; and

h. when *n* is 1, R can be linked to R_2 or R_3 to form an alkyl diradical of 3–10 carbons.

9. Hydroxy-containing dialkyl peroxide compound of the formula:



wherein:

n is 1 to 3 with provisos (a) through (d) recited below,

a. when *n* is 1, R is selected from the group consisting of tertiary alkyl radical of 4–10 carbons, tertiary bicycloalkyl radical of 8–10 carbons, tertiary cycloalkyl radical of 6–8 carbons and tertiary aralkyl radical of 9 carbons and R_3 is selected from —R_1—OO—R; and R_1 and R_3 can join to form a cycloaliphatic triradical of 3–10 carbons;

b. when *n* is 2, R is selected from the group consisting of ditertiary alkylene diradical of 8–20 carbons, ditertiary alkynylene diradical of 8–20 carbons and ditertiary aralkylene diradical of 12 carbons and R_3 is selected from the group consisting of hydrogen, alkyl of 1–15 carbons, cycloalkyl of 3–15 carbons;

c. when *n* is 3, R is selected from the group consisting of tri-tertiaryalkyl triradical of 10–21 carbons and tri-tertiary-aralkyl triradical of 15 carbons and R_3 is selected from hydrogen, alkyl of 1–15 carbons, and cycloalkyl of 3–15 carbons; and

d. R_1 is a tertiary alkyl or cycloalkyl diradical of 3–15 carbons having a tertiary carbon attached to the peroxy oxygen.

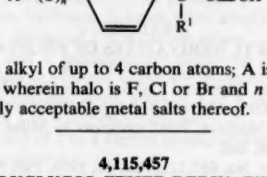
4,115,456

ALKYNE COMPOUNDS AND METHOD OF USE

Joachim Gante; Hans-Adolf Kurmeier; Dieter Orth; Erich Schacht, and Albrecht Wild, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 18, 1976, Ser. No. 697,579
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527352
Int. Cl.[2] C07C *43/20*
U.S. Cl. 260—613 R **24 Claims**

1. A compound of the formula



wherein R^1 is alkyl of up to 4 carbon atoms; A is monohaloor dihalophenyl wherein halo is F, Cl or Br and *n* is 0 or 1, and physiologically acceptable metal salts thereof.

4,115,457

POLYGLYCOL ETHER DERIVATIVES

Achim Wiedemann, Weil am Rhein, Germany, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 703,257, Jul. 7, 1976, abandoned, which is a continuation of Ser. No. 594,199, Jul. 9, 1975, abandoned, which is a continuation of Ser. No. 382,718, Jul. 26, 1973, abandoned, which is a continuation of Ser. No. 191,352, Oct. 21, 1971, abandoned. This application Apr. 7, 1977, Ser. No. 785,532
Int. Cl.[2] C07C *43/02, 41/02*
U.S. Cl. 260—615 B **8 Claims**

1. A polyglycol ether of formula

$$R—C_2H_4O)_x—C_3H_6O)_y—C_2H_4O)_z—H$$

in which

R is secondary alkoxy of 8 to 24 carbon atoms,

x has a value of 9 to 10,

y has a value of 12 to 17,

and

z has a value of 8 to 12.

4,115,458

MIXED POLYHALOGENATED-1,4-BUTANEDIOLS

Eugene V. Hort, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 679,747, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 551,642, Feb. 21, 1975, abandoned, which is a continuation of Ser. No. 295,102, Oct. 5, 1972, abandoned. This application Jul. 29, 1977, Ser. No. 820,544

Int. Cl.[2] C07C *31/34;* C08J *9/00*

U.S. Cl. 568—847 3 Claims

1. 2-Chloro-2,3,3-tribromo-1,4-butanediol.

4,115,459

PREPARATION OF FLUOROTRINITROMETHANE

Louis R. Grant, Jr., Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 9, 1974, Ser. No. 513,630

Int. Cl.[2] C07C *79/12*

U.S. Cl. 260—644 7 Claims

1. A process for preparing fluorotrinitromethane which comprises reacting tetranitromethane with a complex having the following formula:

$$MOCF(CF_{3-x}Cl_x)_2,$$

wherein M is an alkali metal and x is 0 to 2, inclusive, the reaction being conducted in an aprotic solvent.

4,115,460

METHOD FOR PRODUCING HEXACHLOROCYCLOBUTENE

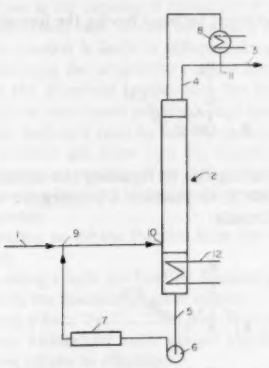
Wolfgang Müller, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,904

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2618557

Int. Cl.[2] C07C *23/06*

U.S. Cl. 260—648 R 5 Claims



1. Method for producing hexachlorocyclobutene from hexachlorobutadiene, comprising;

(a) rectifying in a rectification column technical hexachlorobutadiene at a pressure of about 2–100 mm Hg with a reflux ration of about 300–600, and removing a head product and a sump stream of substance;

(b) heat treating said sump stream of substance at a temperature of about 150°–200° C to cyclize hexachorobutadiene to hexachlorocyclobutene enriched hexachlorobutadiene; and

(c) recycling said enriched hexachorobutadiene into said rectifying together with fresh, technical hexachlorobutadiene.

4,115,461

STABILIZED 1,1,1-TRICHLOROETHANE COMPOSITION

David R. Spencer, and Wesley L. Archer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 712,996, Aug. 9, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,474

Int. Cl.[2] C07C *17/42*

U.S. Cl. 260—652.5 R 2 Claims

1. 1,1,1-Trichloroethane containing as the essential stabilizers from about 3.6 to about 7.6 volume percent based on the total composition volume of a mixture derived from:

1 to 3 volume percent 1,4-dioxane

1 to 3 volume percent t-amyl alcohol

0.5 to 1 volume percent 1,2-butylene oxide, and

0.2 to 0.6 volume percent of a nitroalkane

selected from the group consisting of nitromethane or a mixture of nitromethane and nitroethane containing up to 75 volume percent nitroethane.

4,115,462

GAS PHASE AROMATIC HYDROGENATION USING PALLADIUM LITHIUM ALUMINUM SPINEL CATALYST

Hermann Thelen, Krefeld; Kurt Halcour; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 586,838, Jun. 13, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,868

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1974, 2430478

Int. Cl.[2] C07C *5/10*

U.S. Cl. 260—667 10 Claims

1. In the process for the preparation of cycloaliphatic hydrocarbon by gas phase hydrogenation of the corresponding aromatic hydrocarbon by contacting the same with hydrogen and a catalyst consisting essentially of palladium, the improvement wherein said palladium is disposed on a support consisting essentially of aluminum oxide at least 20% by weight of which, based on weight of said support, is in the form of lithium aluminum spinel and the process is carried out at atmospheric pressure employing catalyst bed temperature of 200° to 350° C.

4,115,463

PRODUCTION OF CYCLOALKYLAROMATICS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1975, Ser. No. 608,597

Int. Cl.[2] C07C *15/00*

U.S. Cl. 260—668 B 10 Claims

1. A process for producing cycloalkylaromatics and alkyl-substituted cycloalkylaromatics which comprises contacting a monocyclic aromatic hydrocarbon or alkyl-substituted monocyclic aromatic hydrocarbon with hydrogen in the presence of a catalyst consisting essentially of from about 0.01 to 0.3 weight percent ruthenium, from about 0.03 to 1.0 weight percent nickel and a support material selected from the group consisting of active clay and silica-alumina in a weight ratio of ruthenium to nickel in the approximate range of 0.01:1 to 0.3:1, wherein said nickel is introduced into said support material as nickel bromide, wherein said contacting is effected at a temperature in the range of about 100° to about 275° C at a hydrogen pressure in the range of about 100 to about 2000 psig and an LHSV in the range of 20 to 35.

4,115,464

PROCESS FOR PREPARING DIARYLETHYLENES

Joseph P. Bartek, University Hts.; Serge R. Dolhyj, Parma; Louis J. Velenyi, Lyndhurst, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 2, 1977, Ser. No. 792,638

Int. Cl. C07c *5/42*

U.S. Cl. 260—668 C 13 Claims

1. A process for the dehydrogenation of diarylethanes to the corresponding diarylethylenes wherein said diarylethane is selected from the class consisting of 1,1-diphenylethane, 1,2-diphenylethane, and their methyl nuclear-substituted derivatives, the process comprising passing a gaseous mixture of the diarylethane, molecular oxygen and optionally a diluent gas, over a catalyst at a temperature of from about 250° to 650° C, said catalyst having the compositon represented by the empirical formula:

$$M_aM^1_dP_xO_y$$

wherein

M is at least one element selected from the group consisting of bismuth, antimony, iron, nickel, cobalt, chromium, lanthanum, cerium, uranium, tin, calcium or magnesium;

M^1 is one or more elements of the group germanium, lead, molybdenum, tungsten, strontium, barium, arsenic, manganese, rhenium, thorium, the rare earths, except lanthanum and cerium, the metals of Groups 1A, 1B, IIB, IIIA, or VB of the Periodic Classificaton of elements;

P is phosphorus; and

wherein

a is a number from 0.1 to 10;

b is a number from 0 to 10;

x is a number from 0.5 to 10; and

y is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,115,465

SEPARATION OF AROMATIC HYDROCARBONS FROM MIXTURES, USING POLYURETHANE MEMBRANES

Klaus Elfert; Hans Jürgen Rosenkranz, and Hans Rudolf, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 26, 1977, Ser. No. 800,812

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627629

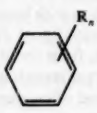
Int. Cl.² C07C *7/01*

U.S. Cl. 260—674 R 26 Claims

1. In a process for separating a first component from a mixture of the same with other components wherein the mixture is disposed on one side of a membrane and a higher pressure is established on the mixture side of the membrane than on the opposed side, said first component is withdrawn through said membrane to said opposed side and at least a partial vacuum is applied to the opposed side of membrane and said first membrane is withdrawn from said membrane in a vapor state, the improvement wherein:

A. the membrane is (of) an aromatic selective polyurethane membrane;

B. the first component has the formula



wherein R represents an alkyl group having 1 to 3 carbon atoms and *n* is 0, 1, 2 or 3; and

C. said first component is in admixture with one or more aliphatic hydrocarbon, cycloaliphatic hydrocarbon, alcohol, ether, ketone or carboxylic acid ester.

4,115,466

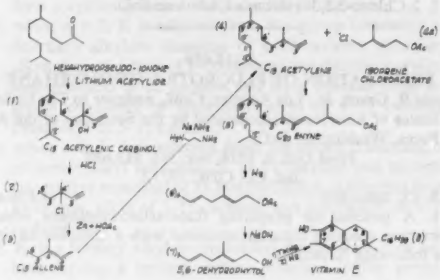
SYNTHESIS OF ACETYLENIC COMPOUNDS USEFUL IN PREPARING DEHYDROPHYTOLS AND VITAMIN E

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

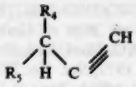
Continuation-in-part of Ser. No. 622,972, Oct. 16, 1975, abandoned, which is a division of Ser. No. 560,550, Mar. 20, 1975, Pat. No. 4,055,575. This application Oct. 6, 1977, Ser. No. 839,962

Int. Cl.² C07C *11/28, 11/22, 5/22*

U.S. Cl. 260—678 9 Claims



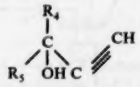
1. A process for the synthesis of an acetylenic compound having the formula



(1)

wherein R_4 and R_5 are hydrogen, alkyl, aralkyl, alkenyl, alkadienyl, alkatrienyl, phenyl and substituted phenyl, comprising the steps of

reacting an acetylenic carbinol having the formula



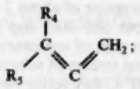
(2)

with a reagent capable of replacing the hydroxyl group with a radical X to produce a propargylic compound having the formula

(3)

X being halogen, alkyl sulfonate, or aryl sulfonate;

reductively removing said radical forming an allene having the formula



(4)

isomerizing said allene in the presence of a strong base to the acetylene of equation (1).

4,115,467

HYDROCARBON CONVERSION PROCESS

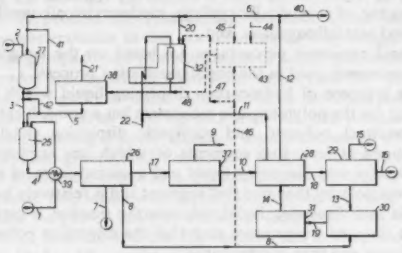
Ray Fowler, Amersham, England, assignor to Davy Powergas Limited, London, England

Filed Aug. 13, 1976, Ser. No. 714,260

Claims priority, application United Kingdom, Aug. 14, 1975, 33928/75

Int. Cl.[2] C07C *11/04*

U.S. Cl. 260—683 R 8 Claims



1. A process for producing ethylene which comprises:

(a) feeding a carbonaceous fuel and an oxygen-containing gas to a combustion zone;

(b) maintaining the fuel to oxygen ratio in the combustion zone at a ratio such that the fuel is partially combusted to form a hot gaseous carbon monoxide-containing combustion product gas;

(c) Supplying hydrogen and a hydrocarbon feedstock at a predetermined ratio to a non-catalytic vapour phase hydrogenation zone, the hydrocarbon feedstock being selected from C_3 and higher hydrocarbons and mixtures thereof, and the predetermined ratio being chosen to favour formation of ethylene and ethane in the hydrogenation zone at the expense of formation of methane, and the predetermined ratio further being such that the hydrogenation reaction is liable to self-quenching;

(d) maintaining the temperature in the hydrogenation zone above the threshold temperature for the hydrogenation reaction at the chosen predetermined hydrogen to hydrocarbon feedstock ratio by admitting thereto hot combustion product gas from step (b) thereby preventing the hydrogenation reaction from self-quenching;

(e) recovering from the hydrogenation zone a reaction product stream;

(f) separating an ethane fraction from the reaction product stream;

(g) separating a light gas fraction containing carbon monoxide from the reaction product stream;

(h) passing ethane fraction from step (f) to an ethane pyrolysis zone maintained under ethane pyrolysis condition to convert ethane to ethylene;

(i) recovering ethylene from step (h);

(j) submitting carbon monoxide of the light gas fraction from step (g) to a water gas shift conversion step in a shift conversion zone for conversion of carbon monoxide to carbon dioxide and concurrent generation of hydrogen;

(k) recovering from this shift conversion zone a shifted gas product containing carbon dioxide and hydrogen;

(l) removing carbon dioxide from resulting shifted gas product; and

(m) recycling resulting hydrogen containing gas to the non-catalytic vapour phase hydrogenation zone.

4,115,468

METHOD FOR DIMERIZATION OF OLEFINS

Andrei Alexandrovich Antonov, Profsojuznaya ulitsa 87, korpus 3, kv. 85; Viktor Alexandrovich Kabanov, Lomonosovsky prospekt 14, kv. 108; Marina Alexandrovna Martynova, ulitsa Stasovoi 4, kv. 34; Nikolai Sergeevich Nametkin, Leninsky prospekt 13, kv. 11; Stanislav Konstantinovich Pluzhnov, pereulok Yazykovsky 5, kv. 104, and Vladimir Ivanovich Smetanjuk, ulitsa Stasovoi 4, kv. 34, all of Moscow, U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,084

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D 9 Claims

1. A method for dimerization of olefins having up to 10 carbon atoms, which comprises: intermixing at least one of said olefins with a two-component catalyst in a medium of solvents selected from the group consisting of hydrocarbon solvents and halogenated hydrocarbon solvents at a temperature ranging from −20° to +100° C at a pressure of from 1 to 45 atmospheres, said two-component catalyst consisting of an organoaluminum compound of the formula R_nAlX_{3-n}, wherein R is an alkyl having up to eight carbon atoms, X is a halogen, i n equals 1 or 2; and a graft-copolymer swellable in said solvents, of a rubber selected from the group consisting of natural, synthetic carbo-chain and vinyl-containing siloxane rubbers, with vinylpyridine; said copolymer containing 0.5 to 40% by weight of polyvinylpyridine fragments complexed with a nickel salt; the molar ratio between said organometallic compound and said nickel salt ranging from 1:1 to 100:1.

4,115,469

METHOD OF DIMERIZATION OF OLEFINS

Jury Nikolaevich Bocharov, ulitsa Dokukina 3, korpus 1, kv. 13; Andrei Alexandrovich Antonov, Profsojuznaya ulitsa 87, korpus 3, kv. 85; Viktor Alexandrovich Kabanov, Lomonosovsky prospekt 14, kv. 108; Marina Alexandrovna Martynova, ulitsa Stasovoi 4, kv. 34; Stanislav Konstantinovich Pluzhnov, pereulok Yazykovsky 5, kv. 104, and Vladimir Ivanovich Smetanjuk, ulitsa Stasovoi 4, kv. 34, all of Moscow, U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,262

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D 3 Claims

1. A method of dimerization of olefins having from 2 to 4 carbon atoms, consisting in that at least one of said olefins is mixed with a gel-like catalyst in a medium of solvents selected from the group consisting of hydrocarbon and halocarbon solvents, at a temperature of from 0° to 100° C and a pressure of from 1 to 40 atmospheres, said catalyst being a graft-copolymer of rubber, selected from the group consisting of natural and synthetic carbon-chain rubber, with vinylpyridine, said copolymer swelling in said solvents, and containing from 0.5 to 40 per cent by weight of fragments of polyvinylpyridine that are complexed with a salt of nickel, and also contains from 2 to 50 mole per cent of —AlRX- units, where R is an alkyl having not more than 8 carbon atoms, and X is a halogen, the aluminum atom being connected with the main chain of the copolymer through the carbon atom; the atom ratio of Al/Ni is from 1 to 20.

4,115,470

ORGANOPHOSPHORUS NICKEL COMPLEXES AND USE THEREOF

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 684,350, May 7, 1976. This application Dec. 8, 1977, Ser. No. 858,760

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D 6 Claims

1. A process for oligomerizing monoolefins comprising contacting under suitable reaction conditions at least one said monoolefin with a catalyzing amount of a catalyst system

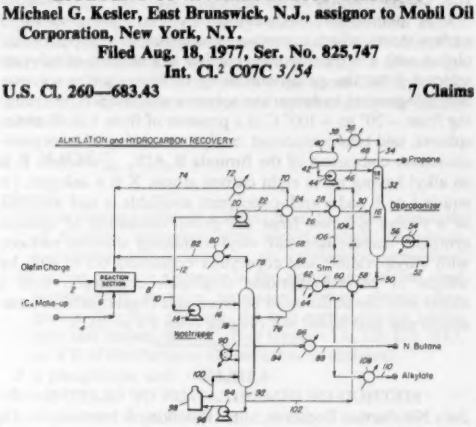
comprising at least one organoaluminum compound R_nAlX_{3-n} wherein each R is a hydrocarbyl radical having from 1 to 20 carbon atoms, each X is a halogen, and n is 1, 1.5, or 2; and bis(μ-diphenylphosphido)tris(triethylphosphine)-dinickel wherein the mole ratio of said organoaluminum compound to said dinickel complex is in the range of about 0.5:1 to about 20:1.

4,115,471

METHOD FOR SEPARATING THE PRODUCT EFFLUENT OF AN ALKYLATION PROCESS

Michael G. Kesler, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,747
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.43 **7 Claims**



1. In a process for alkylating isoparaffins and olefins with an acid catalyst, the improved method for separating the hydrocarbon effluent of the alkylation process which comprises,

separating the hydrocarbon effluent of an alkylation process into first and second separate hydrocarbon effluent streams of the same composition,

passing the first of said hydrocarbon effluent streams to a stripping zone maintained under temperature and pressure conditions providing the recovery of an isoparaffin rich stream from the upper portion thereof and a product alkylate stream from a bottom portion thereof,

passing the second of said hydrocarbon effluent streams after cooling to a depropanizer separation zone, recovering propane and lower boiling components from said depropanizer zone separate from higher boiling alkylate effluent material,

passing separated higher boiling alkylate effluent material from said depropanizer zone to a flash zone maintained under temperature and pressure conditions providing an isoparaffin rich stream separate from a higher boiling alkylate product stream, recycling the isoparaffin rich stream separated in said flash zone after cooling thereof to said alkylation zone, and

passing the higher boiling alkylate product stream separated in said flash zone to said stripping zone.

4,115,472

URETHANE COATING COMPOSITIONS

Samuel Porter, Jr., Tarentum, and Bruce N. McBane, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 559,957, Mar. 19, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,753
Int. Cl.² C08L 63/10, 75/04
U.S. Cl. 260—836 **15 Claims**

1. In a polyurethane coating composition comprising an ungelled hydroxyl-containing urethane reaction product of an organic polyisocyanate and a polyhydric material having a hydroxyl value of at least 10, the improvement which comprises the presence therein of from about 2 percent to about 50 percent by weight, based on said coating composition, of insoluble crosslinked acrylic polymer microparticles formed by the free radical addition copolymerization of from about 0.5 percent to about 15 percent of alpha, beta-ethylenically unsaturated monocarboxylic acid, at least one other copolymerizable monoethylenically unsaturated monomer, and from about 0.5 percent to about 15 percent of crosslinking monomer selected from the group consisting of (1) epoxy group-containing compound and (2) a mixture of alkylenimine and organoalkoxysilane, wherein:

a. said epoxy group-containing compound is monoepoxide compound which additionally contains ethylenic unsaturation,

b. said organoalkoxysilane is selected from the group consisting of acrylatoalkoxysilane, methacrylatoalkoxysilane and vinylalkoxysilane, and

c. said monomer percentages are based on the weight of monomers used in the copolymerization process,

in the presence of hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers but a non-solvent for the resultant polymer, and polymeric dispersion stabilizer containing at least two segments of which one segment is solvated by said dispersing liquid and a second segment is of different polarity than said first segment and is relatively insoluble in said dispersing liquid, wherein the reaction is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked.

4,115,473

POLYOL INTERMEDIATE, POLYESTERS MADE THEREFROM, AND POLYESTER COATING COMPOSITIONS

John D. Downs, Bradley, Ill., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 632,757, Nov. 17, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,249
Int. Cl.² C08L 67/02
U.S. Cl. 260—850 **5 Claims**

1. A coating composition comprising the polyester resin which consists essentially of, by weight of the total solids charged, 35–40 percent of a polyol intermediate that is the reaction product of neopentyl glycol with dimethyl glutarate in a molar ratio of 2 moles neopentyl glycol per mole dimethyl glutarate and at a temperature of between about 120° C. and about 210° C., until at least about 90 weight percent of theoretical methanol of reaction has been removed, 15–23 percent neopentyl glycol, and 40–45 percent phthalic acid reactant; said resin having an Acid Number between about 1 and about 20, and an aminoplast, using a weight ratio of polyester/aminoplast of about 90/10 to about 70/30, dissolved in an aromatic hydrocarbon solvent to a total solids content of between about 60 and about 75 weight percent.

2. The coating composition of claim 1, wherein said phthalic acid reactant is a mixture of phthalic anhydride and isophthalic acid and said aminoplast is hexamethoxymethylmelamine.

4,115,474

GRAFTED, POLYMERIC MICROCAPSULAR SYSTEM

Anthony E. Vassiliades, Deerfield; David N. Vincent, Glenview, both of Ill., and Shrenik Shroff, Bombay, India, assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 235,008, Mar. 15, 1972, Pat. No. 3,844,816, which is a continuation-in-part of Ser. No. 142,772, May 12, 1971, Pat. No. 3,824,114. This application May 21, 1974, Ser. No. 471,885
Int. Cl.² C08F 261/04, 261/02
U.S. Cl. 260—855 **6 Claims**

1. Discrete, substantially spherical non-pressure rupturable microcapsules having a solid, polymeric shell and a core, which consists essentially of a solid, non-tacky polymeric material, said polymeric core material being at least partially grafted to said polymeric shell, said solid, non-tacky polymeric core and said polymeric shell being formed of different poly-

mers, said solid, polymeric shell consisting essentially of an hydroxylated polymer, a formaldehyde condensation product, polyvinyl chloride or gelatin.

4,115,475

METHOD TO PREPARE COPOLYESTERAMIDES FOR MOULDING

Paul Foy, Paris, and René Kern, Savigny-sur-Orge, both of France, assignors to Ato Chimie, Courbevoie, France

Filed Jul. 13, 1976, Ser. No. 704,815
Claims priority, application France, Jul. 17, 1975, 75 22365
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 PE **11 Claims**

1. A process for synthesizing sequence linear aliphatic copolyesteramides having not less than 60% by weight polyamide groups for use in making rigid or semi-rigid moulded or extruded articles with a Vicat point higher than 140° C. and a torsional rigidity modulus G, measured by the Clash and Berg method, of 500 to 4,000 kg/cm2 at 20° C., said process comprising reacting a linear aliphatic copolyesteramide with hydroxyl end-groups, with a molecular weight of 1,000 to 10,000, and containing about 50% polyamide groups, with a linear aliphatic polyamide with carboxyl end-groups, having a molecular weight of 2,000 to 15,000, at temperatures of 200° to 300° C., in an 0.1 to 2 mm Hg vacuum, and in the presence of 1×10^{-4} to 2% weight of an esterification catalyst.

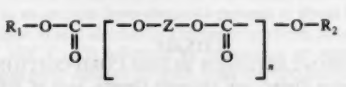
4,115,476

2,2,6,6-TETRAMETHYL-4-PIPERIDYL CARBONIC ACID ESTERS OF DIHYDRIC ALCOHOLS AND PHENOLS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed May 5, 1977, Ser. No. 794,172
Claims priority, application Japan, May 20, 1976, 51-58221
Int. Cl.[2] C07D *401/12*; C08K *5/34, 5/35*
U.S. Cl. 260—880 R **33 Claims**

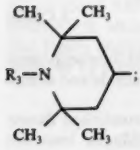
1. A 2,2,6,6-tetramethyl-4-piperidyl carbonic acid ester having the general formula:



I

wherein:

R_1 and R_2 are selected from the group consisting of



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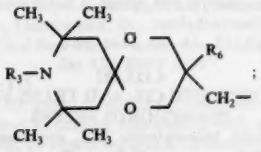

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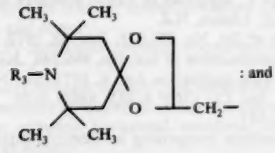

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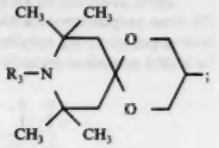


;

the R_1 and R_2 groups can be the same or different;

R_3 is selected from the group consisting of hydrogen and O·

R_6 is lower alkyl;

n is selected from the group consisting of 1, 2, 3, 4 and 5; and

Z of—O—Z—O—is selected from the group consisting of bivalent aliphatic, cycloaliphatic, aromatic, mixed aliphatic-aromatic, aliphatic-cycloaliphatic and cycloaliphatic-aromatic radicals, and oxyalkylene radicals including ether —O— and thioalkylene radicals including thioether —S— linking groups between alkylene groups, having from one to about five oxy or thio groups and from two to about six alkylene groups having from two to about six carbon atoms.

30. An acrylonitrile-butadiene-styrene polymer having its resistance to deterioration when heated at 300° F. and above enhanced by a compound in accordance with claim 1.

4,115,477

PROCESS FOR RECOVERING GRAFT COPOLYMERS LATEX SOLIDS WHEREIN A FINES FRACTION IS RECYCLED AND INCORPORATED IN SAID SOLIDS

Alonzo E. Morris, Cincinnati, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 16, 1977, Ser. No. 833,836
Int. Cl.[2] C08F *279/06*
U.S. Cl. 260—880 R **22 Claims**

1. In a process for recovering solids with a reduced fines-fraction from an aqueous polymeric latex comprising a grafted conjugated diene polymer wherein said diene polymer is a substrate grafted with a superstrate polymer of a monomer formulation comprising a monovinylidene aromatic and an acrylic monomer, wherein said process comprises: (a) mixing said latex with an aqueous electrolyte solution until a homogeneous form-sustaining paste is obtained, (b) forming said paste into at least one shaped unit, (c) heating said shaped paste unit in an aqueous medium maintained at a temperature at least as high as the heat distortion temperature of the superstrate polymer to synerize and harden said paste units into polymeric particles, (d) removing said polymer particles from said aqueous medium, and (e) drying said particles, the improvement which comprises:

(f) separating a portion of said polymer particles as a fines-fraction in step (d) and

(g) dispersing said fines-fraction into at least a portion of said latex at a location prior to step (a), maintaining the rate of dispersion in step (g) at a rate sufficient to recycle a predetermined amount of said fines-fraction separated in step (f).

4,115,478

HIGH IMPACT POLYMER AND PROCESS FOR ITS PRODUCTION

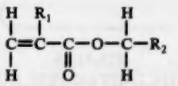
Henry Alsberg, Northbrook; Dale W. Skalla, Oak Park, and Michael R. Tirpak, Maywood, all of Ill., assignors to Richardson Corporation, Des Plaines, Ill.

Continuation of Ser. No. 520,838, Nov. 4, 1974, abandoned, which is a continuation of Ser. No. 335,347, Feb. 23, 1973, abandoned. This application Sep. 17, 1976, Ser. No. 721,742
Int. Cl.[2] C08F *279/06*
U.S. Cl. 260—880 R **9 Claims**

1. A suspension polymerization process for producing transparent, high impact resistant copolymers which comprises:

(A) a first suspension polymerization step, at primary poly-

merization conditions in the presence of a suspending agent dissolved in water, said first step reacting an aqueous suspension of a block styrene-butadiene elastomeric copolymer, an acrylic monomer material, and styrene, said monomer material having the following formula:



wherein R_1 is hydrogen or an alkyl group having from 1 to 3 carbon atoms, and R_2 is hydrogen or an alkyl group having 1 to 15 carbon atoms, to form an intermediate bead prepolymer, said intermediate bead prepolymer containing said acrylic monomer and said styrene grafted onto the backbone of the elastomeric polymer; and

(B) a second suspension polymerization step, at secondary polymerization conditions without adding further suspending agent, said second step reacting additional quantities of reactants consisting essentially of styrene and said acrylic monomer with said intermediate bead prepolymer while same is still suspended in the aqueous medium, the additional styrene and acrylic monomer thereby permeating said intermediate bead prepolymer for in situ reaction formulation of a final beaded polymer product blend of styrene and said acrylic monomer grafted onto said elastomeric polymer and a random copolymer of styrene and said acrylic monomer; said acrylic monomer and styrene together making up about 70 to 95 percent of the total charge of reactants in the entire process, about ⅛ to about ⅜ by weight of the total quantity of said acrylic monomer and styrene used in the entire process being added in said first polymerization reaction step with the remaining quantities of acrylic monomer and styrene being added in said second polymerization reaction step.

4,115,479

CASTING RESINS BY POLYMERIZING LIQUID MONOMER IN MIXTURE OF PARTICULATED VINYL HALIDE RESINS

Philip Daidone, Matawan, N.J., assignor to Vynacron Dental Co., Matawan, N.J.

Filed Aug. 11, 1976, Ser. No. 713,364
Int. Cl.[2] C08L *27/06*
U.S. Cl. 260—884 **11 Claims**

1. A casting resin wherein the finished casting has a combined vinyl resin content of from 20 to 65% prepared by polymerizing a liquid monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, butylmethacrylate, i-butyl methacrylate, i-propyl methacrylate, the corresponding acrylates, hydroxyacrylates and hydroxy methacrylates and their mixtures; diethylene glycol dimethacrylate, triethylene glycol dimethacrylate and tetraethylene glycol dimethacrylate and their mixtures in the presence of (A) vinyl halide resin having a particle size within the range of 0.2 to 5 μ and (B) vinyl halide resin having a particle size within the range of 15 to 150 μ wherein said liquid monomer is a non-solvent at room temperature for said vinyl halide resins A and B and wherein said vinyl halide resins A and B are present in a ratio of A:B of 1-5:5-1.

4,115,480

METHOD OF PRODUCTION OF ACRYLIC RESIN FOR FILM USE AND AN ACRYLIC RESIN OBTAINED THEREFROM

Yoshikiyo Kinoshita, Suita; Takashi Aoi, Akashi; Yoshihiro Kimura, Settsu, and Yumiko Amisaki, Toyonaka, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 603,330, Aug. 11, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,917
Claims priority, application Japan, Aug. 23, 1974, 49-97276
Int. Cl.[2] C08L *31/02*
U.S. Cl. 260—885 **16 Claims**

1. An acrylic resin for film use having less tendency to stress whitening, produced by the method consisting essentially of the following two steps:

(A) copolymerizing a monomer having cross-linking ability with a mixture of monomers consisting essentially of
100 to 70 weight percent-acrylic acid alkyl ester containing 1 to 8 carbon atoms in the alkyl group,
0 to 30 weight percent methacrylic acid alkyl ester containing 1 to 4 carbon atoms in the alkyl group, and
0 to 20 weight percent unsaturated monomer of the ethylene series copolymerizable with said monomers of this step, thereby to produce a cross-linked elastomer having a gel content of more than 60%, a degree of swelling of less than 15 and mean particle size of 500 to 2000 A; and

(B) graft copolymerizing in an emulsion, 90 to 50 parts by weight of a resin component, in the presence of 10 to 50 parts by weight of said cross-linked elastomer obtained in step (A) without further addition of an emulsifier to effect degree of grafting of said resin component onto said elastomer of 43 percent or more by means of no addition of a molecular weight regulating agent, wherein said resin component consists essentially of 100 to 60 weight percent methacrylic acid alkyl ester containing 1 to 4 carbon atoms in the alkyl group, 0 to 30 weight percent acrylic acid alkyl ester containing 1 to 8 carbon atoms in the alkyl group and 0 to 10 weight percent of an unsaturated monomer of the ethylene series copolymerizable with said monomers of this step.

4,115,481

FLUOROELASTOMER BLEND COMPOSITION

Joseph Burton Finlay, and Hisanori Omura, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1977, Ser. No. 834,055
Int. Cl.[2] C08L *27/16, 27/10*
U.S. Cl. 260—900 **6 Claims**

1. A fluoroelastomer blend comprising:

(a) 5–90 weight percent of a non-crosslinked fluoroelastomer comprising a copolymer of vinylidene fluoride and at least one other fluoroolefin, and

(b) 10–95 weight percent of a partially crosslinked fluoroelastomer comprising vinylidene fluoride, at least one other fluoroolefin and about 0.5–3.0 mole percent of bromotrifluoroethylene.

4,115,482

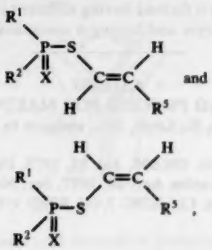
STEREOSPECIFIC CIS- AND TRANS-VINYLIC PHOSPHORUS ESTERS

Alexis A. Oswald, Mountainside, N.J., and Joseph H. Lesser, Woodside, N.Y., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 371,811, Jun. 20, 1973, abandoned, which is a continuation of Ser. No. 846,244, Jul. 30, 1969, abandoned. This application Apr. 6, 1977, Ser. No. 785,034
Int. Cl.[2] C07F *9/165*; A01N *9/36*
U.S. Cl. 260—957 **11 Claims**

1. A composition comprising an isomeric mixture of com-

pounds having at least 70% of the trans-isomer of compounds having the general formula:



and

wherein R^1 and R^2 are C_1 to C_{30} hydrocarbyloxy radicals, R^5 is a C_1 to C_{30} hydrocarbyl radical, and X is O or S.

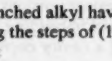
4,115,483

PROCESS FOR PREPARING MONO-ALKYL ACID PHOSPHATES HAVING HIGH MONO-CONTENT AND LIGHT COLOR

Gershon Jerry Davis, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 23, 1977, Ser. No. 827,192
Int. Cl.² C07F 9/09
U.S. Cl. 260—980 **5 Claims**

1. A process for preparing mono-alkyl acid phosphates having the formula:



wherein R is straight or branched alkyl having from 1 to about 25 carbon atoms, comprising the steps of (1) first contacting an alcohol having the formula:

ROH

wherein R is as defined above, with tetrasodium pyrophosphate in an amount from about 0.1 percent to about 0.5 percent by weight of said alcohol at a temperature from about 20° C. to about 180° C.; (2) followed by contacting an approximately stoichiometric amount of P_2O_5 with the alcohol-tetrasodium pyrophosphate mixture at a temperature from about 20° to about 180° C. and mixing; (3) followed by contacting water and hydrogen peroxide, P_2O_5 in stoichiometric excess, and alcohol to the mixture of step (2) at a temperature from about 40° to about 200° C.; and (4) mixing at a temperature from about 40° to about 200° C. until the reaction is complete and then finally adding hydrogen peroxide to the reaction mixture followed by additional mixing.

4,115,484

COOLING TOWER FILL ASSEMBLY

Forest Jackson Saxton, Calistoga, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sep. 16, 1977, Ser. No. 834,012
Int. Cl.² B01F 3/04
U.S. Cl. 261—111 **27 Claims**

1. In a cooling tower in which air flows through splash fill within the tower in cooling relationship with a liquid falling through said fill, an improved splash fill assembly comprising:

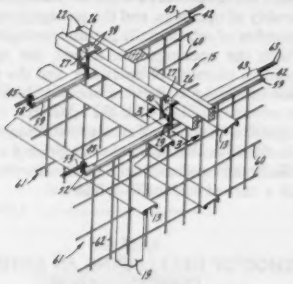
(a) a plurality of column means extending generally vertically in said tower;

(b) generally horizontal members connected to said column means;

(c) a plurality of beam hanger clips supported by each horizontal member at spaced intervals therealong, the hanger clips on adjacent horizontal members being generally aligned in series;

(d) an elongated generally horizontal fill hanger beam supported by each series of aligned clips;

(e) a fill hanger grid supported at its upper end by each fill hanger beam, each grid comprising generally horizontal and vertical strands connected so as to form a lattice of



holes, the holes on adjacent grids being generally aligned, and

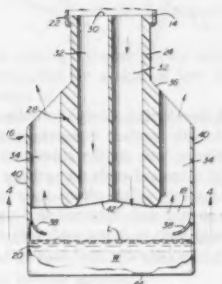
(f) a plurality of generally horizontal splash fill members extending through said aligned holes in said grids and being supported on said generally horizontal strands.

4,115,485

LINT INTERCEPTOR

Richard J. Genessi, 2434 Rivera St., San Francisco, Calif. 94116

Filed Jun. 27, 1977, Ser. No. 810,387
Int. Cl.² B01F 3/04
U.S. Cl. 261—119 R **1 Claim**



1. In a lint interceptor, including, in combination:

(a) a housing having a frusto-conical top portion and a rectangular lower portion provided with a cavity forming a liquid reservoir, the top portion including a vertically extending, longitudinal neck including passage means for communicating with the cavity:

(b) fitting means provided on the neck of the top portion of the housing for connecting a hose to the housing and placing the hose in communication with the cavity; and

(c) aperture means provided in the top portion of the housing for permitting the escape from the housing of a fluid ejected into the cavity at the fitting means;

(d) the improvement comprising baffle means arranged within the housing for directing the flow of the fluid through the housing along a desired path, the baffle means being arranged in the housing above the cavity provided in the housing, the baffle means including passage means disposed in communication with the fitting means, cavity, and aperture means for forming a flow path through the housing, the baffle means further including opposed wall portions extending from the top portion to the lower

portion, and opposed curved fender means arranged beneath the passage means and attached to the wall portions and extending a relatively short distance into the cavity from the wall portions and disposed above an upper level of the liquid reservoir for directing fluid flow from the passage means across the upper level of the liquid reservoir and to the aperture means, the fitting means including a plurality of openings, and the passage means including a like number of substantially parallel passages communicating with the openings, one-to-one, the aperture means including a plurality of apertures, and the passage means further including a like number of substantially parallel bores communicating with the apertures, one-to-one, the passages and bores being arranged substantially parallel to one another, the baffle means comprising a body member in which the apertures and bores are provided and on which a curved surface is defined.

4,115,486

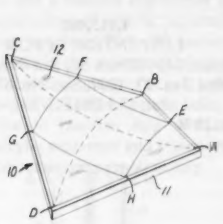
METHOD OF DEVELOPING AN ANTICLASTIC CONCENTRATOR

Charles D. Cowman, Jr., St. Paul, Minn., and John P. G. Shepherd, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 560,541, Mar. 20, 1975, Pat. No. 4,035,064. This application Apr. 25, 1977, Ser. No. 790,581

Int. Cl.[2] B29D *11/00;* **B29C** *17/02*

U.S. Cl. 264—1 **4 Claims**



1. Method of developing a rigid continuous hyperbolic paraboloidal anticlastic surface comprising affixing a specularly reflective elastic web to the sides and ends of a rigid closed frame, said sides and ends comprising spaced elongate rigid supports angularly offset about their mutual axes, and applying a force to said web between said supports by means for contracting said web to bring said web to a condition of minimum surface area between said supports.

4,115,487

METHOD FOR DENTAL RESTORATION

Thomas J. Rockett, East Greenwich, R.I., and John J. O'Connell, Tustin, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 416,807, Nov. 19, 1973, abandoned. This application Jul. 17, 1974, Ser. No. 489,093

Int. Cl.[2] A61C *13/04*

U.S. Cl. 264—16 **10 Claims**

1. A method for forming dental restorations comprising the steps of mixing and applying to a site requiring dental restoration a composite sub-layer comprising a mixture of a polymerizable resin binder having a refractive index within the range of about 1.53 to 1.56, a reinforcing filler comprising a finely-divided inorganic compound having a particle size no greater than about 50 microns and having a refractive index substantially different than the refractive index of said resin, and a catalyst for curing said resin; and mixing and applying to the same site, over said sub-layer and before the resin of said sub-layer has fully cured, a composite surface layer comprising the same resin and catalyst components used in said sub-layer in admixture with a reinforcing filler consisting of a finely-divided inorganic compound having a particle size no greater than about 50 microns and having substantially the same refractive index as that of said resin, whereby, a double-layered dental restoration is formed having different refraction characteristics in each layer and having a continuous resin phase.

4,115,488

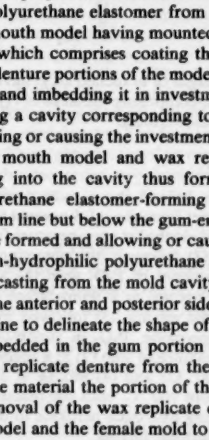
DENTURES AND PROCESS FOR MAKING THE SAME

Ralph W. Colpitts, St. Louis, Mo., assignor to Polythetics, Inc., St. Louis, Mo.

Division of Ser. No. 595,035, Jul. 11, 1975, Pat. No. 4,024,637. This application Apr. 20, 1977, Ser. No. 789,120

Int. Cl.[2] B29C *5/00;* **B29D** *9/00*

U.S. Cl. 264—17 **11 Claims**



1. The process for making a denture comprising teeth of hard non-hydrophilic polyurethane elastomer imbedded in soft non-hydrophilic polyurethane elastomer from a model assembly comprising a mouth model having mounted thereon a wax replicate denture, which comprises coating the mouth model and wax replicate denture portions of the model assembly with a release material, and imbedding it in investment material to form a mold having a cavity corresponding to the wax replicate denture, allowing or causing the investment material to set up, removing the mouth model and wax replicate denture therefrom, pouring into the cavity thus formed hard non-hydrophilic polyurethane elastomer-forming material to a depth above the gum line but below the gum-engaging portion of the denture to be formed and allowing or causing it to set up to form a hard non-hydrophilic polyurethane elastomer casting, removing the casting from the mold cavity and trimming off the flash from the anterior and posterior sides of the casting down to the gum line to delineate the shape of that portion of the teeth to be imbedded in the gum portion of the denture, removing the wax replicate denture from the mouth model, coating with release material the portion of the mouth model exposed by the removal of the wax replicate denture, assembling the mouth model and the female mold to form a denture mold, introducing thereinto soft non-hydrophilic polyurethane-forming material and allowing or causing the same to set up therein to form soft non-hydrophilic polyurethane elastomer and to chemically unite with the portions of the hard non-hydrophilic polyurethane elastomer teeth with which it is in contact, removing the cast denture from the mold and finishing them as needed.

4,115,489

PLASTICIZING AND MOLDING ARTICLES FROM POLYMER STRIP

Norman W. Macfee, Conneaut Lake, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Jun. 24, 1977, Ser. No. 809,842

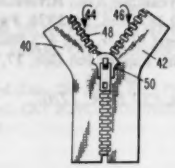
Int. Cl.[2] B29D *5/00;* **B29C** *5/00, 11/00*

U.S. Cl. 264—23 **10 Claims**

1. In a method of manufacturing coupling elements for a slide fastener, the steps comprising:

advancing a continuous filament of thermoplastic,

sequentially plasticizing unsevered successive portions of the filament, and



molding the plasticized successive portions in cavity means to at least partially form coupling elements.

4,115,490

MOLDING METHOD

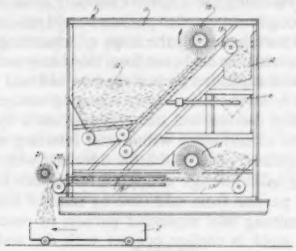
Edmund Munk, Oberstenfeld, Germany, assignor to Furnier- und Sperrholzwerk J. F. Werz Jr. KG Werzalit-Pressholzwerk Oberstenfeld, Oberstenfeld, Germany

Continuation of Ser. No. 479,490, Jun. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 224,511, Feb. 8, 1972, abandoned. This application Dec. 12, 1975, Ser. No. 640,384

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1971, 2105998

Int. Cl.[2] B29C *25/00*; B29G *1/00*

U.S. Cl. 264—26 **2 Claims**



1. In a method of making molded articles, in combination, the steps of storing in a supply container a pourable mixture comprised of a heat-setting binder and a particulate and porous fibrous material the fibers of which contain in absorbed condition both moisture and a part of the heat-setting binder; continually transporting the pourable mixture of heat-setting binder and fibrous material from the supply container along a predetermined path into an unheated mold, the transporting step comprising pouring the pourable mixture into the unheated mold; subjecting the mixture poured into the unheated mold to a cold-molding operation in the mold without addition of heat to the mixture in the mold and not resulting in setting of the binder; during said transporting step utilizing a high-frequency electromagnetic field to impart to the pourable mixture of heat-setting binder and fibrous material, prior to entry thereof into the unheated mold, an adhesiveness so great that the mixture in the unheated mold, upon completion of a molding operation without addition of heat to the mixture in the mold, can be removed from the unheated mold as a unitary body and thereafter transported away from the unheated mold without falling apart, the imparting of said adhesiveness consisting of utilizing the high-frequency electromagnetic field to heat the pourable mixture of heat-setting binder and fibrous material to a temperature which does not cause the heat-setting binder to set and which is furthermore no higher than between 40° and 100° C. to convert the individual fibers of the fibrous material into a state in which the absorbed moisture and binder within the individual fibers throughout the fibrous material are expelled from the interiors to the surfaces of the individual fibers without thereby substantially changing the overall moisture content of the mixture, said molding operation performed in the unheated mold being carried out with the individual fibers of the fibrous material in said state; and upon completion of the molding operation, and without adding heat to the mixture in the mold, removing the mixture from the unheated mold as a unitary body and transporting it as a unitary body away from the unheated mold.

4,115,491

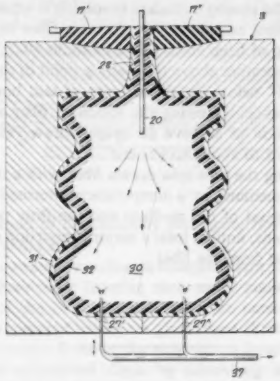
METHOD OF MAKING THERMOPLASTIC ARTICLES WITH POROUS CORES

Robert Hanning, Via Tagliaferri 15, Campione d'Italia, Italy

Division of Ser. No. 599,055, Jul. 25, 1975, Pat. No. 4,033,710. This application May 17, 1976, Ser. No. 687,339

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—45.1 **3 Claims**



1. A method of making a thermoplastic article with a highly porous core surrounded by a skin of low to zero porosity, comprising the steps of:

providing a supply of substantially homogeneous flowable thermoplastic material;

directing part of said material in the form of an outer tubuler stream through a nozzle into a restricted entrance end of a mold cavity closed at its opposite end;

directing another part of said material, after initiation of the flow of said outer tubular stream, through said nozzle into said cavity as an inner tubular stream coaxially enveloped by said outer tubular stream;

continuously admixing a foaming agent with said inner tubular stream ahead of said entrance end;

admitting a fluid under pressure along the axis of said streams into said cavity, thereby building up a relatively nonporous continuous outer layer of said material on an inner cavity wall including said opposite end and a relatively porous continuous inner layer contiguously overlying said outer layer; and

allowing said layers to harden in said cavity.

4,115,492

PROCESS FOR PREPARING MICROPOROUS POLYETHYLENE HOLLOW FIBERS

Robert D. Mahoney, Dublin, and Stephen E. Schneider, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 619,431, Oct. 3, 1975, Pat. No. 4,020,230. This application Jan. 28, 1977, Ser. No. 763,480

Int. Cl.[2] B29H *7/20*

U.S. Cl. 264—49 **8 Claims**

1. A process for preparing a hollow fiber which consists essentially of polyethylene and is a microporous hollow fiber

in which the porosity is contiguous and the O_2 gas permeability is at least 2×10^{-5} cc (STP) per cm^2 per second per cm Hg transmembrane pressure differential, said process comprising:

(a) providing a polyethylene/ester mixture of which about 20 to about 80 weight percent consists essentially of polyethylene and the balance consists essentially of an ester or a mixture of esters, of the formula $R^1(COOR^2)_n$, wherein n is 1 or 2, R^1 is a mono- or divalent hydrocarbon radical, optionally interrupted by one or two —O— or —S— links, and containing from 1 to 32 carbons, each R^2 independently is an aliphatic hydrocarbon radical of 2–26 carbon atoms or consists of two aliphatic hydrocarbon moieties joined by an —O— or —S— link and containing a total of from 3 to 20 carbons;

(b) heating said polyethylene/ester mixture to a temperature at which it is a homogeneous liquid but below the boiling or decomposition temperature thereof, and extruding it from a spinnerette in the form of a hollow fiber;

(c) cooling the issuing extrudate to solidify it while maintaining sufficient tension on the forming fiber to achieve a draw ratio of from about 1.0/1 to about 40/1;

(d) at a temperature above the melting point of the ester, but at least 10° below the cloud point of said homogeneous liquid, post-spin drawing the solidified fiber under sufficient tension to achieve an overall draw ratio of from about 1.5/1 to about 800/1; and

(e) contacting the post-spin drawn fiber with a liquid ester-removal medium, at a temperature intermediate of the freezing point of the medium and the flow point of the polyethylene, until at least a major proportion of the ester is removed from the fiber.

4,115,493

METHOD FOR MAKING A MONOLITHIC CERAMIC CAPACITOR EMPLOYING A NON-REDUCING DIELECTRIC CERAMIC COMPOSITION

Yukio Sakabe, and Hiroshi Seno, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 19, 1977, Ser. No. 826,115
Claims priority, application Japan, Aug. 19, 1976, 51/99397
Int. Cl.² C04B *35/46*
U.S. Cl. 264—61 **3 Claims**

1. A method for making a monolithic ceramic capacitor with internal electrodes made of base metal or alloy of the group consisting of nickel, iron, cobalt and alloys thereof, the method comprising the steps of preparing a plurality of dielectric green sheets with a dielectric ceramic composition, forming an internal electrode on each green sheet, stacking and pressing the resultant green sheets to form a monolithic multilayer unit, and providing terminations for the resultant monolithic unit, the terminations being electrically connected to the internal electrodes of the monolithic unit, wherein the improvement comprises mixing and presintering raw materials in such compositional proportions to produce said dielectric ceramic composition having the formula

$$\{(Ba_{1-x}Ca_x)O\}_m(Ti_{1-y}Zr_y)O_2$$

wherein

$1.005 \leqq m \leqq 1.03$

$0.02 \leqq x \leqq 0.22$

$0 < y \leqq 0.20$,

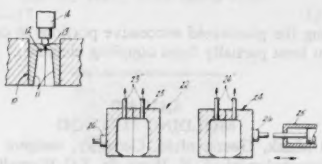
and the firing is effected in a reducing atmosphere containing hydrogen.

4,115,494

METHOD FOR CONTROLLED PROCESSING OF BLOWN PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 479,287, Jun. 14, 1974, Pat. No. 3,970,419, and a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application Dec. 17, 1975, Ser. No. 641,638
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **31 Claims**



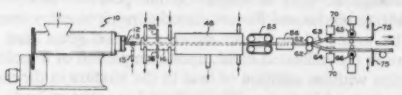
1. In a method for the preparation of hollow objects of moldable organic material by providing a parison in a formable condition, locating said parison in a blow mold, and expanding said parison within said blow mold to form an expanded parison, the improvement which comprises: providing a temperature adjusting retaining mold spaced laterally from said blow mold; transferring said expanded parison to said retaining mold by means of a core including the steps of separating said expanded parison while on said core from said blow mold, aligning said core with expanded parison thereon and said retaining mold by relative lateral movement, engaging said core with expanded parison thereon and said retaining mold by relative axial movement to seat same within said retaining mold and placing said expanded parison in surface contact with the walls of the retaining mold through an applied force; then separating said expanded parison from said core by relative axial movement and permitting said expanded parison to reside within said retaining mold in surface contact with the walls of the retaining mold for a predetermined period of time sufficient to adjust the temperature thereof before removal therefrom said applied force being continued through at least a part of said predetermined period of time has been inserted.

4,115,495

PROCESSING EXTRUDED THERMOPLASTIC POLYMER

Joachim Ernst Hartitz, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 6, 1977, Ser. No. 785,264
Int. Cl.² B29D *7/04*
U.S. Cl. 264—90 **7 Claims**



1. A method of manufacturing house siding comprising the steps of extruding a hollow rectangular shaped thermoplastic extrudate, cooling said extrudate immediately after said extruding, thence vacuum sizing and cooling said hollow extrudate as it is moved in a linear direction away from said extruder, thence cooling said sized extrudate to ambient temperature, thence heating the respective longitudinally extending corners of said hollow extrudate as it is fed in a direction away from said extruder to stress relieve said corners, cutting said hollow extrudate into continuous two separate flat L-shaped sidings,

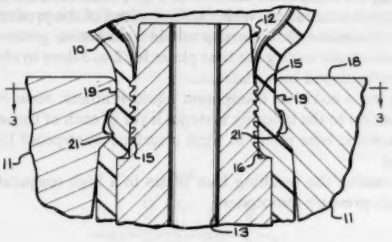
and thence cutting said sidings into predetermined length panels.

4,115,496

METHOD FOR MOLDING A THREADED BUNGHOLE

Thomas J. Krall, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 28, 1977, Ser. No. 810,767
Int. Cl.[2] B29C *5/06*; B29D *23/03*
U.S. Cl. 264—94 3 Claims



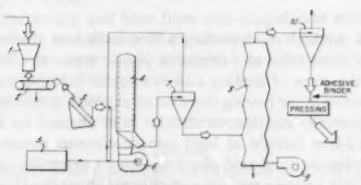
1. A method for molding a threaded hole in a blowmolded article comprising the steps of: positioning a parison within an interior space defined by open mold sections, said open mold sections having a main body portion and at least one compression molding portion; partially extending a threaded pin assembly into one end of said parison such that a portion of the threads on said pin assembly are within the confines of the compression molding portion of the mold sections; partially closing the open mold sections about the parison and the pin assembly to mold said portion of said threads in said parison; completing molding of threads in the parison by fully extending the pin assembly after the parison has substantially filed said portion of said threads and completely closing said mold sections and expanding the parison into contact with a blow cavity defined by the mold sections to form the blowmolded article with a threaded opening.

4,115,497

PROCESS FOR THE PRODUCTION OF PRESSED BODIES FROM MUNICIPAL REFUSE

Terje Martin Halmø, and Liv Skoglund, both of Trondheim, Norway, assignors to Elopak A/S, Spikkestad, Norway

Filed Dec. 1, 1976, Ser. No. 746,550
Claims priority, application Norway, Dec. 1, 1975, 754035
Int. Cl.[2] B29J *1/00*
U.S. Cl. 264—115 8 Claims



1. In a process of producing pressed bodies comprising preparing particulate material, adding adhesive binder thereto and pressing the resulting mixture into pressed bodies, the improvement which comprises preparing said particulate material from municipal refuse by the steps of:

(a) dividing up collected refuse, without the addition of fluid, to reduce its particle size;

(b) drying the refuse particles in a hot gas until their water content is reduced to less than 15 weight percent; and

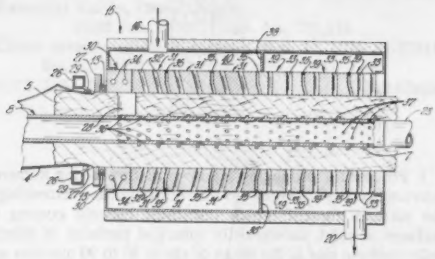
(c) screening the resulting particles of refuse in a stream of air in order to separate particles of at least those heavy fractions of metal, glass and stone thereby leaving behind the desired particulate material.

4,115,498

METHOD AND APPARATUS FOR MOLDING ARTICLES FROM FIBROUS MATERIAL

Ronald E. Kissell, Alexandria, and Ulysses T. Gambill, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 27, 1976, Ser. No. 661,893
Int. Cl.[2] B29D *23/00*
U.S. Cl. 264—119 8 Claims



1. A method of continuously producing fibrous glass pipe insulation comprising:

a. continuously advancing an elongated strip of fibrous glass wool between a forming shoe and a mandrel longitudinally of the strip and axially of the mandrel, the wool having uncured binder on glass fibers thereof;

b. continuously forming the strip into a longitudinally split hollow cylindrical shape by advancing it through the forming shoe to form it around the mandrel;

c. continuously advancing the formed strip through a curing chamber wherein the binder is cured while the strip is confined in the hollow cylindrical shape; and

d. continuously cooling the formed strip immediately before it enters the curing chamber to prevent partial curing of the binder in upstream portions of the strip in the forming shoe and thereby prevent build-up of binder on the forming shoe.

4,115,499

LARGE VOID-FREE POLYETHYLENE CASTINGS

Ival O. Salyer, Dayton, and Charles J. North, West Carrollton, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 565,165, Apr. 4, 1975, Pat. No. 3,979,357, which is a division of Ser. No. 425,894, Dec. 13, 1973, Pat. No. 3,929,939, which is a continuation of Ser. No. 219,498, Jan. 20, 1972, abandoned. This application Jan. 16, 1976, Ser. No. 649,628
Int. Cl.[2] C08L *23/06*
U.S. Cl. 264—122 8 Claims

1. A method of making a void-free composite of polyethylene which comprises the steps of:

(a) placing in a mold a blend of 25 to 50 weight percent low density polyethylene powder with 50 to 75 weight percent high density polyethylene pellets;

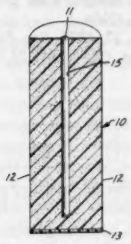
(b) heating the blended polyethylene to a temperature above the melting point of the low density polyethylene, but below the temperature at which the high density polyethylene will flow; and

(c) causing the molten low density polyethylene to flow to fill the voids.

4,115,500
PROCESS FOR PRODUCING A POROUS MATRIX

Douglas W. Voegeli, Shoreview, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 539,088, Jan. 7, 1975, Pat. No. 3,978,176, which is a continuation-in-part of Ser. No. 286,112, Sep. 5, 1972, abandoned. This application Jun. 14, 1976, Ser. No. 695,904
Int. Cl.[2] B29G *1/00*
U.S. Cl. 264—122 7 Claims

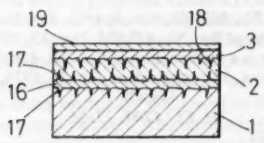


1. Process for producing a porous matrix having numerous interconnecting passageways therethrough and extending to the surfaces thereof which comprises entirely coating the surfaces of solid, substantially spherical particles of substantially uniform size in the range of about 30 to 90 microns with a solid, uncured thermosetting resin to a substantially uniform coating thickness provided by employing about 10 to 15 parts by weight of solid resin for each 100 parts of spherical particles and distributing said resin evenly over the surfaces of said particles, placing a mass of said coated particles in a heated mold, in the presence of an inert lubricant, subjecting said mass to pressure just sufficient to adhere the coated particles to each other at points of contact but not so much pressure as to fill the interstices between said coated particles, and then, curing the said resin to a unitary matrix in which the said resin is confluent at said point of contact while remaining in place as a uniform coating of essentially its original thickness over the surfaces of said particles in the interstices therebetween.

4,115,501
METHOD OF PRODUCING CEMENT PANELS REINFORCED WITH FIBERS

Naomichi Yano, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,533
Claims priority, application Japan, Feb. 12, 1976, 51-14728; Feb. 12, 1976, 51-14729
Int. Cl.[2] C04B *41/04;* B28B *1/16*
U.S. Cl. 264—133 3 Claims



1. A method of producing cement panels reinforced with fibers comprising the successive steps of:

preparing a soft base plate material by spreading a mixture composed predominantly of inorganic fibers and a cement to a uniform thickness and applying water to the spread mixture,

applying a liquid synthetic resin composition to a surface of the soft base plate material to form an inner waterproof layer thereon, with the synthetic resin composition penetrating into the base plate material among the particles thereof,

applying a finely divided coloring material to the waterproof layer immediately after the application of the synthetic resin composition to form a layer of the coloring material, with the synthetic resin composition penetrating also into the coloring material layer among the particles thereof, the coloring material being composed predominantly of a cement and a pigment mixed together,

pressing the resulting coated base plate material to compact the material,

cutting the compacted material to a shape of suitable dimensions in accordance with the dimensions of the product to be obtained and to thereby obtain base plates,

spontaneously curing the base plates for 2 to 3 days to obtain semihardened base plates,

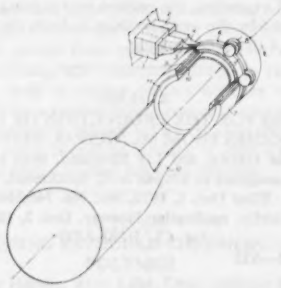
applying a colorless transparent liquid synthetic resin composition to the coloring material layer of each of the semihardened base plates to form a surface waterproof layer, and

maintaining the resulting base plates in a high-temperature high-pressure atmosphere.

4,115,502
EXTRUSION METHOD INVOLVING ROTATIONS

Ole-Bendt Rasmussen, 14, Anemonevej, 2820 Gentofte, Denmark

Filed Dec. 9, 1975, Ser. No. 639,006
Int. Cl.[2] B29F *3/10*
U.S. Cl. 264—173 13 Claims



1. A method of extruding a continuous or discontinuous tubular sheet from an extrudable plastic material which comprises the steps of feeding said extrudable material to a rotatable extrusion die having there on an exposed, exteriorly accessible generally continuous circular inlet channel by laying in pressure-free fashion at least one continuous stream of said extrudable material said channel along a generally tangential path while rotating said die and channel about the channel axis to lay said stream in spiral fashion within said channel, said die having at one end spaced from said channel a continuous or discontinuous generally circular extrusion orifice in communication with the bottom of said channel through a continuous or discontinuous circular passageway, applying pressure against the material spiraled in said channel downstream of the tangential point of delivery by means associated with said channel and operative upon rotation of said channel about its axis to advance the material through said die and out of said orifice, and collecting the thus extruded sheet.

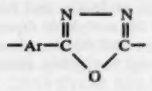
4,115,503

NOVEL PROCESS FOR THE PREPARATION OF FIBER OF ARYLENE OXADIAZOLE/ARYLENE N-ALKYLHYDRAZIDE COPOLYMER

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

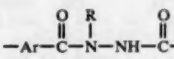
Continuation-in-part of Ser. No. 390,667, Aug. 22, 1973, abandoned, and a continuation of Ser. No. 202,590, Nov. 26, 1971, abandoned, and Ser. No. 422,041, Dec. 5, 1973, abandoned, and a continuation of Ser. No. 202,669, Nov. 26, 1971, abandoned. This application Nov. 4, 1974, Ser. No. 520,503
Int. Cl.² D01F *7/00*
U.S. Cl. 264—184 10 Claims

1. A process for preparing fiber of a random copolymer consisting essentially of recurring units of the formulas



(I)

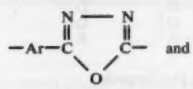
and



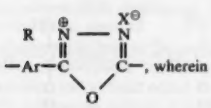
(II)

wherein Ar is arylene and R is lower alkyl and wherein the mole ratio of units (I) to units (II) is between 20:80 and 95:5 comprising

(1) extruding a spinning dope into an aqueous coagulation medium, said dope consisting essentially of (a) a random copolymer having an inherent viscosity of at least 2.0 and consisting essentially of recurring units of the formulas



(A) and



(B), wherein

X^- is an anion contained in said dope and Ar and R have the same meaning as above and wherein the mole ratio of units (A) to units (B) is between 20:80 and 95:5 and (b) a solvent consisting essentially of oleum or sulfuric acid of at least 90% concentration;

(2) reacting said copolymer of the dope with water present in said aqueous coagulation medium and obtaining said copolymer consisting essentially of units (I) and (II) in the shape of a fiber;

(3) withdrawing said fiber from said coagulation medium;

(4) washing said fiber with water and an aqueous alkaline solution to remove and/or neutralize sulfuric acid which is in contact therewith; and

(5) drying said fiber.

4,115,504

METHOD FOR CASTING VITREOUS MATERIALS USING THE LOST WAX PROCESS

Jean Dewitte, Boulogne, and Pierre Letourneur, Paris, both of France, assignors to Compagnie Internationale de Minerallurgie-CIM, Neuilly-sur-Seine, France

Filed Nov. 12, 1976, Ser. No. 741,452
Claims priority, application France, Nov. 19, 1975, 75 35301
Int. Cl.² B29C *1/02*
U.S. Cl. 264—221 18 Claims

1. A process for casting vitreous materials according to the lost wax process comprising:

(a) making a pattern of an article to be cast using a substance which is vaporized at the casting temperature of the vitreous material;

(b) embedding the vaporizable pattern in a heat resistant silica compound such as sand or microballs of a refractory oxide which surrounds the pattern to form a casting mold, the sand or microballs being contained in a receptacle called a casting shell;

(c) casting the vitreous material at a temperature at which its viscosity is between 20 and 100 poises; and

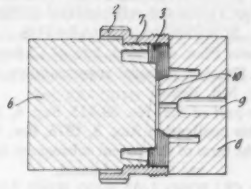
(d) removing the cast article from the casting mold.

4,115,505

PROCESS AND APPARATUS FOR THE MANUFACTURE OF THREAD ENGAGEABLE MEMBERS

Tsuneyo Metabi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1977, Ser. No. 772,373
Claims priority, application Japan, Mar. 12, 1976, 51-27515
Int. Cl.² B29C *5/00;* B29D *23/02;* B29F *1/00*
U.S. Cl. 264—242 10 Claims



1. The method for making an assembled pair of first and second tubular members having mutually engaging threaded portions, comprising: positioning a set of die members with said first tubular member releaseably fastened to a first of said die members at a predetermined position thereon by engaging threads of said first tubular member with threads of said first die member until said first tubular member abuts a shoulder of said first die member, inserting a second of said die members into said first tubular member, abutting said first die member, said die members and said first tubular members defining a mold cavity therebetween, at least a threaded portion of said first tubular member defining a surface of said cavity, and said cavity being coaxial with said first member threaded portion injecting a molten thermoplastic material into said cavity cooling and solidifying said thermoplastic material in said cavity to produce said second tubular member in threaded engagement with said first tubular member, separating said die members and removing said first and second tubular members.

4,115,506

METHOD FOR PRODUCING INJECTION MOLDED SKI

Yoshiharu Shima, Ueda, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Division of Ser. No. 751,755, Dec. 17, 1976. This application Oct. 26, 1977, Ser. No. 845,542
Int. Cl.² B29D *3/00;* B29F *1/00*
U.S. Cl. 264—250 4 Claims

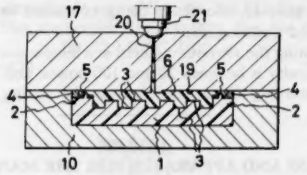
1. A method for producing injection molded skis which comprises:

(A) closing a pair of molds including a female mold having mold surfaces for forming the top surface and both side surfaces of a ski body and a first mold half having mold surfaces to form a bottom surface and edge receiving surfaces having a plurality of projections, of said ski body, and injecting molten thermoplastic resin into the cavity of said closed molds to form a ski body having edge receiving protions with said projections;

(B) opening said molds by removing said first mold half from said female mold and fitting a pair of steel edges to said

edge receiving portions by fixing said steel edges to said projections on said edge receiving portions; and

(C) closing said female mold with a second mold half forming another cavity between said ski body and said second mold half, and injecting thermoplastic resin into said another cavity to form a sole plate which is integrally joined with said ski body and said steel edges.



4,115,507

MANUFACTURE OF ABRASION-RESISTANT SCREENING APPARATUS

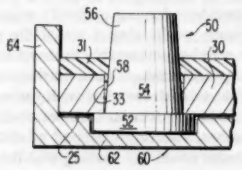
Francisco Antonio Pico, deceased, late of Chihuahua, Mexico, and James J. Shanley, personal representative, 10910 Picasso La., Potomac, Md. 20854

Continuation-in-part of Ser. No. 69,813, Sep. 4, 1970, Pat. No. 3,972,974. This application Aug. 3, 1976, Ser. No. 711,212

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.[2] B29D *3/02, 9/00;* B29G *7/00*

U.S. Cl. 264—267 **26 Claims**



1. A method of coating a perforated substrate to produce a screening member of increased abrasion resistance, the substrate having upper and lower major surfaces and having perforations defined by sidewalls extending between said major surfaces, said method comprising the steps of

providing a plurality of forms, each form having a base portion and a pair of consecutively superposed sections carried by the base section, the lower section contiguous to the base having sidewalls not greater in size and shape than the sidewalls of a perforation, the upper section having sidewalls inwardly spaced from the sidewalls of the first upper section, the cross sectional area of the upper section in planes parallel to the upper major surface of the substrate not increasing throughout the height of the upper section, the base portion being designed to limit movement of the form relative to the lower major surface of the substrate,

positioning a form in each perforation with the base portion contiguous to the lower major surface of the substrate, with at least the lowermost portion of the lower section embraced by the sidewalls of the perforation and with the upper section protruding above the upper major surface of the substrate,

forming a layer of hardenable elastomer in a plastic state on the upper surface of the substrate to a depth not greater than the height of the upper portion of the form,

hardening the elastomer to form a coating of abrasion-resistant elastomer adhered to the upper surface of the substrate and surrounding the upper portion of the form, and

removing the form after the layer of abrasion-resistant elastomer is formed.

4,115,508

POLYMERS AND ROTATIONALLY MOLDING SAME

James K. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1977, Ser. No. 802,081

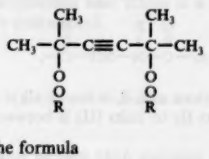
Int. Cl.[2] B29C *5/04;* C08K *3/04*

U.S. Cl. 264—310 **22 Claims**

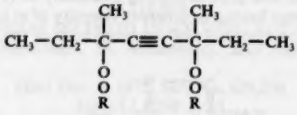
1. A composition of matter comprising a solid polymer, an acetylenic diperoxy compound and a carbon black

wherein the solid polymer is selected from the group consisting of ethylene hompolymers, copolymers of ethylene and at least one acyclic mono-1 olefin hydrocarbon having 3 to 8 carbon atoms per molecule, and mixtures thereof,

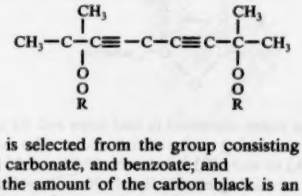
wherein the amount of the acetylenic diperoxy compound is a crosslinking amount and the acetylenic diperoxy compound is selected from the group consisting of hexynes having the formula



octynes having the formula



and octadiynes having the formula



wherein R is selected from the group consisting of tertiary alkyl, alkyl carbonate, and benzoate; and

wherein the amount of the carbon black is an amount to provide a surface area using nitrogen according to ASTM D 3037-76 of up to about 30 m^2/100 g of polymer; and

wherein said polymer has a transition metal catalyst residue content of less than about 3 parts per million.

4,115,509

MOULDING OF FILLED SYNTHETIC PLASTICS MOULDING COMPOSITIONS

Brian John Kendall-Smith, Birmingham, and Michael Glynn Bonnington, Sedgley, both of England, assignors to British Industrial Plastics Ltd., England

Continuation of Ser. No. 630,174, Nov. 10, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,217

Claims priority, application United Kingdom, Nov. 12, 1974, 48980/74

Int. Cl.[2] B29B *5/04*

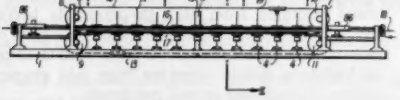
U.S. Cl. 264—331 **8 Claims**

1. The method of injection moulding amino-formaldehyde thermosetting material to produce a cured artefact having filler homogeneously dispersed therewithin without requiring the preliminary step of compounding a moulding powder having the filler already homogeneously dispersed therein, which comprises the steps of:

(a) providing a dry thermosetting amino-formaldehyde ma-

terial which is partly condensed but essentially solid at ambient temperatures;
(b) introducing said dry material and filler in at best a rough, non-homogeneous blend directly into the barrel of an injection moulding machine in the absence of solubilizing quantities of solvent, said machine having a heated barrel and a rotary screw which is axially movable in said barrel;
(c) rotating said screw simultaneously to feed the blend along the barrel, further condense the material, plasticize said material and impregnate the filler with the plasticized material to provide a homogeneous blend, and effect transfer of homogeneous blend ahead of the screw by screw-back of the screw;
(d) injecting homogeneous blend from ahead of the screw into a heated mould; and
(e) curing the artefact in the mould.

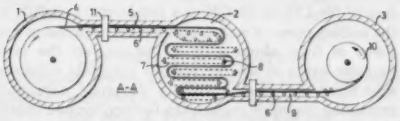
4,115,510
PROCESS AND APPARATUS FOR CURING ELASTOMERIC CONVEYOR BELTS AND THE LIKE
Augusto Previati, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy
Filed Nov. 16, 1976, Ser. No. 742,245
Claims priority, application Italy, Nov. 27, 1975, 29692 A/75
Int. Cl.[2] B29H *5/01, 7/22*
U.S. Cl. 264—347 **6 Claims**



1. A process for curing conveyor belts and the like made out of an elastomeric composition containing volatile substances which comprises the three steps of
(1) heating said conveyor belt to the curing temperature of the elastomeric composition, subjecting it to a pressure less than 6 kg/cm^2 and at least equal to the vapor tension of the volatile substances present in said elastomeric composition while at the curing temperature until the crude elastomeric composition plastifies without significant bubble formation,
(2) maintaining the conveyor belt at the curing temperature of the elastomeric composition, increasing the applied pressure to a valve between 6 and 10 kg/cm^2, and molding the elastomeric composition of the conveyor belt without provoking any danger of alterations in the arrangement of the structure of the conveyor belt itself, and
(3) while still maintaining the conveyor belt at the curing temperature of the elastomeric composition, subjecting said conveyor belt to a pressure of less than 6 kg/cm^2 but not less than the vapor tension of the volatile substances present in the said elastomeric composition until the curing of the elastomeric composition of the conveyor belt is completed.

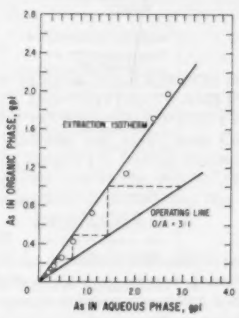
4,115,511
CONTINUOUS VULCANIZATION OF RUBBER
Rune Mauritzon, Box 2024, 550 02 Jönköping, Sweden
Filed Nov. 22, 1976, Ser. No. 743,660
Claims priority, application Sweden, Nov. 27, 1975, 7513413
Int. Cl.[2] B29H *5/01*
U.S. Cl. 264—347 **3 Claims**

1. A method of vulcanization of a strip of rubber or rubber-like material under such an overpressure that blisters in the material are avoided by the material being continuously transported from a first means, in which overpressure and a low temperature are maintained, through a connection to a second means, in which overpressure and vulcanization temperature are maintained, and wherein the material is unrolled in said first means and transported in a path running to and fro through said second means, whereafter the material rolled up



and in that the pressure in said first means is kept somewhat higher than the pressure in said second means in order to reduce the heat leakage, via said connection path, from said second means to said first means.

4,115,512
METHOD FOR REMOVING ARSENIC FROM COPPER AND/OR NICKEL BEARING AQUEOUS ACIDIC SOLUTIONS BY SOLVENT EXTRACTION
Derek G. E. Kerfoot, Edgware, England, assignor to Noranda Mines Limited, Toronto, Canada
Filed Dec. 3, 1976, Ser. No. 747,104
Int. Cl.[2] C01B *27/00*
U.S. Cl. 423—24 **12 Claims**



1. A method for removing arsenic by solvent extraction from a copper and/or nickel bearing aqueous solution containing about 100 to 600 gpl sulphuric acid, comprising contacting said solution with an organic solution consisting of about 5 to 80% by volume of tributylphosphate and a quaternary ammonium reagent in a positive amount up to about 15% by volume in an organic diluent, and subsequently stripping the arsenic from the loaded organic solution with a stripping agent.

4,115,513
PROCESSING OF AMMONIUM PARATUNGSTATE FROM TUNGSTEN ORES
Avinash D. Kulkarni, Montclair, N.J., and James G. Cleary, Dormont Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 16, 1977, Ser. No. 825,124
Int. Cl.[2] C01G *41/00*
U.S. Cl. 423—56 **4 Claims**

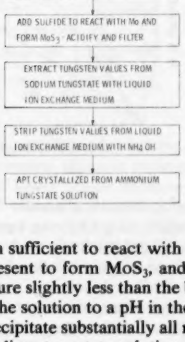
1. The method of obtaining highly purified ammonium paratungstate crystals from tungsten ore, said method comprising:
(a) reducing the ore to be processed to a very finely divided status;
(b) forming a slurry of the finely divided ore in a moderately strong HCl solution and digesting the slurry at a temperature at least about 100° C for a sufficient time to substantially convert the tungsten values in the ore to $WO_3.H_2O$,

separating the resulting tungstic oxide from the acid solution to remove acid-soluble impurities from said tungstic oxide, and water washing the separated tungstic oxide to remove substantially all remaining water-soluble impurities therefrom;

(c) dissolving the washed tungstic oxide in an aqueous solution of Na_2CO_3 or NaOH at a temperature slightly below the boiling point of water with the pH adjusted to a steady value of from about 8 to 8.5 to convert the insoluble tungstic oxide to soluble sodium tungstate solution, and separating the soluble sodium tungstate solution from remaining insoluble material to further remove impurities;

(d) heating the resulting sodium tungstate solution to slightly below the boiling point of water and adding sodium hydroxide thereto to raise the pH to about 10.5 to 11.5, adding to said heated solution magnesium chloride in amount sufficient at least to lower the pH of said solution, thereafter adding to the resulting solution additional sodium hydroxide to raise the pH thereof to about 10.5 to 11.5 to precipitate as hydroxide the magnesium and additional metallic impurity leaving a further purified sodium tungstate solution, and separating the resulting sodium tungstate solution from the formed precipitate;

(e) adding to the further purified sodium tungstate solution at least one of ammonium sulfide and thioacetamide in


GRIND ORE TO FINELY DIVIDED STATUS
DIGEST ORE WITH HCl TO FORM $WO_3 \cdot H_2O$ WHICH IS THEN WATER WASHED
WASHED $WO_3 \cdot H_2O$ IS DISSOLVED IN Na_2CO_3 OR NaOH AT TEMP. SLIGHTLY BELOW BOILING IN pH RANGE OF 8 TO 8.5 TO FORM SODIUM TUNGSTATE-FILTER
ADD $MgCl_2$ TO SODIUM TUNGSTATE AT TEMP. SLIGHTLY BELOW BOILING IN pH RANGE OF 10.5 TO 11.5 - FILTER
ADD SULFIDE TO REACT WITH Mo AND FORM MoS_3 - ACIDIFY AND FILTER
EXTRACT TUNGSTEN VALUES FROM SODIUM TUNGSTATE WITH LIQUID ION EXCHANGE MEDIUM
STRIP TUNGSTEN VALUES FROM LIQUID ION EXCHANGE MEDIUM WITH NH_4OH
APT CRYSTALLIZED FROM AMMONIUM TUNGSTATE SOLUTION

amount more than sufficient to react with any molybdenum impurity present to form MoS_3, and with the solution at a temperature slightly less than the boiling point of water acidifying the solution to a pH in the range of from about 2 to 3 to precipitate substantially all molybdenum as MoS_3 from the sodium tungstate solution, and separating the precipitated MoS_3 from the residual solution;

(f) intimately contacting said purified sodium tungstate solution with a water-immiscible ion exchange liquid in which the active ingredient is amine salt the anionic portion of which is exchanged with the tungstate radical of said sodium tungstate solution to form amine tungstate and the corresponding sodium salt, settling said immiscible liquids to separate them, and isolating the separted liquids from each other;

(g) intimately contacting said tungstate-containing ion exchange liquid with ammonium hydroxide solution to form immiscible ammonium tungstate solution and tungstate-stripped ion exchange liquid, settling said immiscible liquids to separate them, and isolating the separated liquids from each other; and

(h) converting said isolated ammonium tungstate solution to ammonium paratungstate crystals, and separating the precipitated ammonium paratungstate crystals from residual solution.

4,115,514

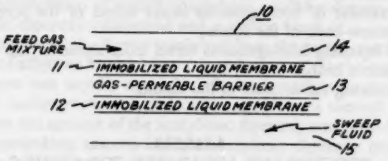
SEPARATION OF HYDROGEN SULFIDE FROM GAS MIXTURE INCLUDING CARBON DIOXIDE

William J. Ward, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 599,871, Jul. 28, 1975. This application May 11, 1977, Ser. No. 796,017

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—232 **3 Claims**



1. A method of selectively removing hydrogen sulfide from a mixture of gases including carbon dioxide, comprising:

contacting a first immobilized liquid membrane with said mixture, said first immobilized liquid membrane consisting of a carbonate bicarbonate mixture to allow facilitated transport of hydrogen sulfide through said first membrane to a porous gas-permeable barrier;

passing gases emerging from said first membrane through said gas-permeable barrier; and

contacting a second immobilized liquid membrane with gases emerging from said gas-permeable barrier, said second immobilized liquid membrane consisting of a carbonate/bicarbonate mixture to allow facilitated transport of hydrogen sulfide emerging from said gas-permeable barrier through said second membrane.

4,115,515

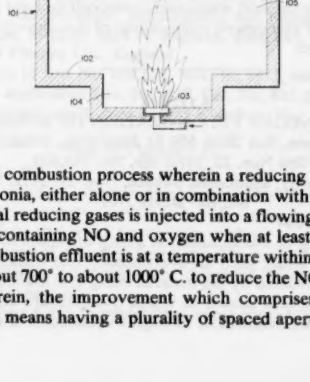
METHOD FOR REDUCING NO_x EMISSION TO THE ATMOSPHERE

Arthur R. Tenner, Morris Plains, and David W. Turner, South Brunswick, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 678,656, Apr. 20, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,868

Int. Cl.[2] C01B *21/00*

U.S. Cl. 423—235 **4 Claims**



1. In a combustion process wherein a reducing gas comprising ammonia, either alone or in combination with one or more additional reducing gases is injected into a flowing combustion effluent containing NO and oxygen when at least a portion of said combustion effluent is at a temperature within the range of from about 700° to about 1000° C. to reduce the NO concentration therein, the improvement which comprises placing an injection means having a plurality of spaced apertures or noz-

zles at a location within the path of said flowing combustion gases and generally perpendicular to the path of said flowing combustion gases, at least a portion of said gases flowing across said injection means being at a temperature in the range of from 700° to 900° C. and at least a portion of said gases flowing across said injection means being at a temperature in the range of from 900° to 1000° C., and injecting a first gas mixture comprising ammonia and an inert diluent and wherein the said ammonia is the sole reducing gas contained therein through one or more of said apertures or nozzles into said combustion gases that are at a temperature in the range of from 900° to 1000° C. and injecting a second gas mixture comprising ammonia, an additional reducing gas and an inert diluent through one or more of said apertures or nozzles into said combustion gases that are at a temperature in the range of from 700° to 900° C.

4,115,516

METHOD OF TREATING EXHAUST GAS DISCHARGED FROM NITRIC ACID PLANT

Koichi Takami; Shingo Abe; Yukio Takigawa, all of Kita-Kyushu; Toshinori Tsutsumi, Fukuoka, and Yoshio Kinsho, Kita-Kyushu, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,354

Claims priority, application Japan, Jun. 22, 1976, 51-73675

Int. Cl.[2] B01D *53/00*

U.S. Cl. 423—239 **6 Claims**

1. In a method for the catalytic reduction of NO_x in a compressed exhaust gas discharged from a compressed absorption type nitric acid plant containing an exhaust gas turbine and catalyst conversion layer with ammonia or an ammonia precursor, the improvement comprising the steps of:

compressing the exhaust gas discharged from said nitric acid plant;

mixing said compressed exhaust gas with ammonia and passing said mixture through a catalyst bed which catalyzes the reductive decomposition of NO_x with ammonia;

preventing the precipitation of ammonium nitrate from said exhaust gas containing an equilibrium mixture of ammonia, NO_x ammonium nitrate by maintaining the temperature of the main flow of the exhaust gas in the zone from the point which ammonia or an ammonia precursor is mixed with said exhaust gas to the outlet of the exhaust gas turbine at a level sufficient to prevent precipitation of said ammonium nitrate from the equilibrium mixture;

feeding an inert gas into passages in said zone where said exhaust gas can stagnate in order to flush exhaust gas from said passages thereby preventing precipitation of said ammonium nitrate; and

discharging the treated exhaust gas through said exhaust gas turbine.

4,115,517

TREATMENT OF SULFUR OXIDES WITH AQUEOUS GLYOXYLIC ACID SOLUTIONS

William H. Stark, Cincinnati, Ohio, and Cheng-Hsien Chu, Etobicoke, Canada, assignors to Spring Chemicals Limited, Toronto, Canada

Filed Aug. 24, 1976, Ser. No. 717,082

Int. Cl.[2] C01B *17/00;* **C01F** *1/00*

U.S. Cl. 423—243 **8 Claims**

1. A process for the extraction of sulfur dioxide and sulfur trioxide from gases containing sulfur dioxide and sulfur trioxide, which process comprises contacting the gas with an aqueous solution of glyoxylic acid to absorb sulfur dioxide and sulfur trioxide in said aqueous solution, removing the sulfur dioxide from the aqueous glyoxylic acid solution by heating to strip the sulfur dioxide as a vapor from the aqueous glyoxylic acid solution, and thereafter removing absorbed sulfur trioxide by contacting the aqueous glyoxylic acid solution with a barium compound selected from the group consisting of barium hydroxide and barium carbonate, the barium compound being essentially inert to the glyoxylic acid and being present in an amount effective to precipitate barium sulfate from the aqueous glyoxylic acid solution.

4,115,518

GAS DESULPHURIZATION

Bernard Delmon, Wavre, and Ghislain Van Houte, Leuven, both of Belgium, assignors to Unibra, Belgium

Filed Nov. 4, 1975, Ser. No. 628,663

Claims priority, application France, Nov. 6, 1974, 74 36862

Int. Cl.[2] C01B *17/00;* **B01J** *8/00;* **C09K** *3/00*

U.S. Cl. 423—244 **18 Claims**

1. A method for desulfurizing flue gases wherein said gases are contacted at a temperature of 250° to 1300° C with a reagent in powdered form consisting of a main component selected from the group consisting of calcium, magnesium and mixed calcium and magnesium oxides, hydroxides and carbonates, said main component being impregnated with an additive in an amount of from 0.1 to 15% by mole, said additive being selected from the group consisting of hydrochloric acid, hydrobromic acid and sulfuric acid followed by drying, thus converting said reagent into a sulfate and recovering said sulfate.

4,115,519

MANUFACTURING PROCESS FOR SODIUM PERBORATE MONOHYDRATE AND PRODUCT OBTAINED ACCORDING TO THE PROCESS

Jean Brichard, Vilvoorde, and Jean-Claude Colery, Brussels, both of Belgium, assignors to Interox, Brussels, Belgium

Filed Nov. 1, 1976, Ser. No. 737,686

Claims priority, application Luxembourg, Nov. 6, 1975, 73751

Int. Cl.[2] C01B *15/12*

U.S. Cl. 423—279 **12 Claims**

1. A process for the manufacture of sodium perborate monohydrate in the form of abrasion resistant granules, comprising introducing an aqueous solution containing hydroen peroxide and an aqueous solution containing sodium metaborate simultaneously into a fluidized bed dryer which contains seeds of a size which is smaller than that of the granules one wishes to obtain, and evaporating the water present in the said aqueous solutions by inroducing fluidization gas into the fluidized bed dryer.

4,115,520

PROCESS FOR THE SYNTHESIS OF TETRADECAHYDROUNDECABORATE COMPOUNDS

Gary Burr Dunks, Peekskill, and Kathy Palmer Ordonez, Eastchester, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 799,005, May 20, 1977, which is a continuation of Ser. No. 668,859, Mar. 22, 1976, abandoned, which is a continuation of Ser. No. 436,663, Jan. 25, 1974, abandoned. This application Sep. 29, 1977, Ser. No. 837,981

Int. Cl.[2] C01B *35/18*

U.S. Cl. 423—287 **3 Claims**

1. Process for preparing a tetradecahydroundecaborate which comprises contact in an inert solvent medium and at a temperature of from 100° C. to 120° C. BF_3 with an octahydrotriborate having the formula MB_3H_8 wherein M represents an ion selected from the class consisting of lithium, sodium, potassium, cesium and alkylammonium.

4,115,521

PROCESS FOR THE SYNTHESIS OF DECABORANE(14)

Gary Burr Dunks, Peekskill, and Kathy Palmer Ordonez, Eastchester, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 668,859, Mar. 22, 1976, abandoned, which is a continuation of Ser. No. 436,663, Jan. 25, 1974, abandoned. This application Jul. 5, 1977, Ser. No. 813,073

Int. Cl.[2] C01B *35/18*

U.S. Cl. 423—294 7 Claims

1. Process for preparing decaborane (14) which comprises contacting and oxidizing tetradecahydroundecaborate (−1) ions at a temperature between −10° and 50° C with an oxidizing agent having an electrode potential (E°) of at least +0.6 volts.

4,115,522

STABILIZED RED PHOSPHORUS AND PROCESS FOR MAKING IT

Horst Staendeke; Franz-Josef Dany, and Joachim Kandler, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,464

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631532

Int. Cl.[2] C01B *25/01, 25/02, 25/04*

U.S. Cl. 423—322 9 Claims

1. In a process for making a homogeneous blend of red phosphorus stabilized against oxidation having a particle size of at most about 2 mm and the neutral aluminum, magnesium, calcium or zinc salt of orthophosphoric acid, the improvement which comprises: intimately blending red phosphorus particles with a size of at most about 2 mm with about 0.5 to 5 weight % of orthophosphoric acid or sodium hydrogen phosphate, based on red phosphorus; suspending the blend in water and heating the resulting suspension to about 60° to 95° C.; gradually admixing the suspension with at least stoichiometric proportions of an aqueous solution of a water-soluble aluminum, magnesium, calcium or zinc salt to cause precipitation of the respective salt of orthophosphoric acid from the aqueous suspension at a pH of 3.0 to 7.5; filtering the resulting mixture, and drying the filter residue comprising a homogeneous blend of red phosphorus and said neutral salt of orthophosphoric acid at elevated temperature.

4,115,523

SYNTHESIS OF HYDROXYLAMINE FROM HYDROGEN SULFIDE AND NITRIC OXIDE

Charles T. Ratcliffe, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 7, 1977, Ser. No. 848,975

Int. Cl.[2] C01B *21/14*

U.S. Cl. 423—387 6 Claims

1. In a process for producing hydroxylamine including reacting excess hydrogen sulfide with nitric oxide, or mixtures of nitrogen oxides, in aqueous acidic media of pH below 7 at ambient temperature and pressure, the improvement which comprises conducting the reaction in the presence of a solid sulfur-resistant catalyst and substantially in the absence of elemental oxygen.

4,115,524

PRODUCTION OF CARBON MONOXIDE

Martin R. Cines, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,927

Int. Cl.[2] C01B *31/18*

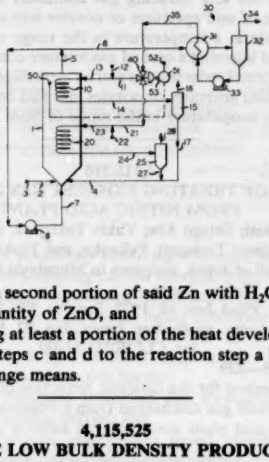
U.S. Cl. 423—415 A 14 Claims

1. A process for the production of carbon monoxide comprising

a. reacting a carbon source with ZnO under such conditions of temperature and pressure that the temperature is at or above the boiling point of zinc under the given pressure conditions and that the reaction forms a gaseous effluent comprising CO and Zn,

b. separating Zn from said gaseous effluent and removing a CO containing gas as the product of the process,

c. oxidizing a first portion of said Zn with air to form a first quantity of ZnO,



d. oxidizing a second portion of said Zn with H_2O to form a second quantity of ZnO, and

e. transferring at least a portion of the heat developed in the oxidizing steps c and d to the reaction step a by indirect heat exchange means.

4,115,525

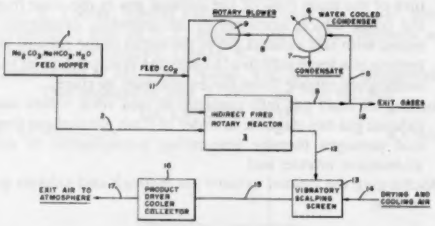
ABSORPTIVE LOW BULK DENSITY PRODUCT FROM SODIUM SESQUICARBONATE

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 2, 1973, Ser. No. 356,663

Int. Cl.[2] C01D *7/14, 7/37*

U.S. Cl. 423—425 6 Claims



1. A method for the treatment of sodium sesquicarbonate particles to product product particles having a bulk density of from 12 to 25 pounds per cubic foot and a pore volume of 0.20 to 0.42 ml/gm (pores having a diameter equal to or less than 2 microns) without loss of particulate identity which comprises passing said sodium sesquicarbonate particles through a reaction zone wherein the particles are heated to a temperature within the range of 70° to 105° C., introducing into said reaction zone a gas mixture comprising by volume 15–85 percent carbon dioxide and 15–80 percent water vapor, maintaining said gas mixture containing water vapor in direct contact with the particles during the initial period of reaction until the particles contain at least 10 percent of Wegscheider's Salt, and continuing the reaction in said reaction zone with Net production of water until the particles contain from 85 percent to in excess of 95 percent by weight of Wegscheider's Salt and have a water content of less than 12 percent by weight, discharging the gas containing water from said reaction zone after contact with the particles, and discharging said product particles from said reaction zone.

4,115,526

PROCESS FOR THE PREPARATION OF REACTIVE TUNGSTEN AND DERIVATIVES THEREOF

James J. Auborn, Warren, N.J., and Elizabeth A. Trickett, Acton, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 17, 1977, Ser. No. 807,362
Int. Cl.[2] C01B *31/34*
U.S. Cl. 423—440 1 Claim

1. A continuous process of preparing binary compounds of tungsten and carbon comprising the steps of

reducing an oxygen-containing tungsten compound by heating said compound in a hydrogen-containing atmosphere at temperatures ranging from about 485° C. to about 585° C., and

carburizing the resultant material in a methane-containing atmosphere at temperatures in the range from about 485° C. to about 600° C.

whereby there is produced finely divided ditungsten carbide (W_2C).

4,115,527

PRODUCTION OF CARBON FIBERS HAVING HIGH ANISOTROPY

Sugio Otani, Kiryu; Shoji Watanabe, Niigata, and Tadashi Araki, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 564,895, Apr. 3, 1975, Pat. No. 4,016,247, which is a continuation-in-part of Ser. No. 20,050, Mar. 16, 1970, abandoned. This application Dec. 29, 1976, Ser. No. 755,603
Claims priority, application Japan, Mar. 31, 1969, 44-24161
Int. Cl.[2] D01F *9/14*
U.S. Cl. 423—447.4 2 Claims

1. In a method of producing carbon fibers having high molecular orientation, anisotropy, strength and modulus of elasticity from pitch as the raw material through the process steps of forming the pitch into fibers, subjecting the same to infusibilization, carbonization, and optionally graphitization treatments, the improvement which comprises forming said raw material pitch through the steps of

(a) heat-treating crude petroleum oil or its fractionated components at a temperature of from 700° C to 2000° C for a period of from 1/1000 to 1/10 second to form resinous pitch or tar,

(b) subjecting the resinous pitch or tar thus-obtained to heat treating at a temperature of 250° C to 550° C for 1 to 300 minutes while distilling off rather volatile matters, and

(c) subjecting the thus heat-treated resinous pitch or tar to a second heating at a temperature of 380° to 450° C for 60 to 300 minutes while removing fine solid particles by filtration,

said raw material pitch thus-obtained having a carbon content in the range of from 95% to 96.5% by weight, a mean molecular weight of from 400 to 2,000, a melt viscosity of from 0.4 to 700 poises at a temperature range of from 320° C to 480° C, and optical anisotropy to such an extent that an isotropic portion thereof can hardly be recognized on examination by a polarization microscope.

4,115,528

METHOD FOR FABRICATING A CARBON ELECTRODE SUBSTRATE

Larry G. Christner, Glastonbury, Conn.; Dennis C. Nagle, Catonsville, Md., and Paul R. Watson, Marlborough, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1977, Ser. No. 824,751
Int. Cl.[2] C01B *31/02;* B29C *25/00*
U.S. Cl. 423—449 9 Claims

1. A method for fabricating a porous carbon sheet comprising the steps of:

coating chopped carbon fibers with a low viscosity mixture of at least 70% by weight furfuryl alcohol, 0.25–5%, by weight, of an aqueous solution of 85% phosphoric acid or an equivalent amount of phosphoric acid, and a balance of water;

forming a mat of said coated fibers;

polymerizing the furfuryl alcohol and curing the mat by heating the mat to a temperature between 50°–200° C.; and

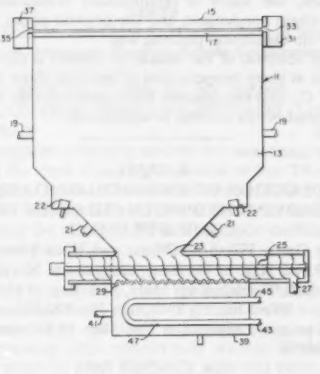
carbonizing the cured mat by heating to at least 1500° C.

4,115,529

HALOGEN HYDRATE FORMATION FROM HALOGEN AND FINELY DIVIDED AQUEOUS DROPLETS

Harvey L. Behling, Madison Heights, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Continuation of Ser. No. 375,567, Jul. 2, 1973, abandoned. This application Dec. 23, 1976, Ser. No. 753,692
Int. Cl.[2] C01B *7/02*
U.S. Cl. 423—472 6 Claims



1. A method of manufacturing a halogen hydrate which comprises the steps of:

maintaining a forming surface at a temperature sufficient to form halogen hydrate from a halogen and an aqueous medium, said surface being maintained at a temperature from about −20° to about −5° C;

introducing under pressure onto said forming surface:

a halogen and

an aqueous medium consisting of a plurality of atomized liquid droplets each having a diameter between 1 millimicron and about 10 microns, the temperature of said aqueous medium being maintained above the freezing point of said medium and below 5° C.

the pressure of said aqueous medium being greater than the pressure of said halogen, and said halogen and said aqueous medium being introduced in amounts such that the stoichoimetric ratio of halogen to water in the aqueous medium is at least about 6 moles of water per mole of halogen;

contacting said halogen and said aqueous medium on said forming surface such that the droplets of said medium are surrounded by said halogen to form halogen hydrate with

a small percentage of some halogen becoming dissolved; and

removing said halogen hydrate from said forming surface.

4,115,530
PROCESS FOR OBTAINING GASEOUS HYDROGEN CHLORIDE FROM DILUTE, AQUEOUS HYDROCHLORIC ACID

Alfred Coenen; Kurt Kosswig, and Günter Prominski, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huis AG, Marl, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,761

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633640

Int. Cl.[2] C01B *7/08*

U.S. Cl. 423—488 **22 Claims**

1. A process for the production of gaseous hydrogen chloride by extraction of dilute aqueous hydrochloric acid with amines, wherein:

(a) aqueous hydrochloric acid is extracted with an amine selected from the group consisting of tertiary alkyl amines, tertiary aryl dialkyl amines, secondary arylalkyl amines, primary alkylaryl amines, or mixtures thereof, which contain 14–32 carbon atoms in the nitrogen-bound side chains, and among these at most one nitrogen-bound methyl group and at least one aliphatic group containing at least 6 carbon atoms, and wherein the acid constant K_a of the amine is smaller than 10^{-3};

(b) an inert, water-immiscible organic solvent which has a lower boiling point than the amine employed is added to the extract;

(c) the extract is distilled, the vapors thus-formed are condensed, the water is continuously separated from the two-phase condensate, and the organic phase is returned into the distillation process; and

(d) after removal of the water, the extract is distilled under reflux at sump temperatures of between about 100° C. and 250° C., and the gaseous hydrogen chloride liberated at the head of the column is withdrawn.

4,115,531
PRODUCTION OF HYDROCHLORIC ACID BY REMOVING HYDROGEN CHLORIDE FROM COMBUSTION GAS

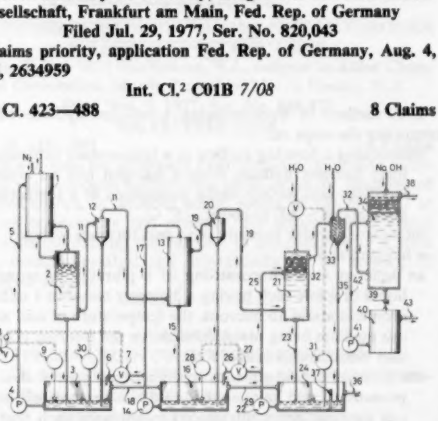
Wolfgang Opitz, Hürth-Alstädten, and Hans Hennen, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,043

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634959

Int. Cl.[2] C01B *7/08*

U.S. Cl. 423—488 **8 Claims**



1. A process for the continuous production of hydrochloric acid having a substantially constant HCl content of 20 to 36% by removing hydrogen chloride from hot combustion gas which comprises: introducing hot combustion gas containing 1 to 10% by volume of HCl and steam, this gas being obtained by the joint combustion of off-gases containing chlorinated hydrocarbons and liquid residues of chlorinated hydrocarbons, into a quenching zone, and quenching it therein, down to a temperature lower than its dew point, by means of cooled hydrochloric acid containing hydrogen chloride in a concentration of 20 to 36%, which concentration corresponds to the concentration of the hydrochloric acid which is to be produced; introducing the resulting gas-liquid mixture into an absorption cooling zone wherein upon cooling steam is condensed and gaseous hydrogen chloride absorbed in the liquid, the phases separating into cooled hydrochloric acid and cooled combustion gas containing 0.1 to 1% by volume of HCl; introducing the said cooled hydrochloric acid into a reservoir zone capable of receiving a multiple of the quantity of hydrochloric acid produced per hour; and recycling the hydrochloric acid from the said reservoir zone to the quenching zone, the additional 20 to 36% hydrochloric acid produced being taken out of the quenching cycle comprising the said quenching, absorption cooling and reservoir zones, as the desired product.

4,115,532
PREPARATION OF SOLID TITANIUM TRICHLORIDE

Kazuo Yamaguchi, Fujisawa; Genjiro Kakogawa; Masayoshi Hasuo, both of Yokohama; Nobuaki Goko, and Yasuo Maruyama, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 600,819, Jul. 31, 1975, Pat. No. 4,060,593, which is a continuation-in-part of Ser. No. 598,425, Jul. 23, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,910

Claims priority, application Japan, Jul. 31, 1974, 49/88476; Jul. 31, 1974, 49/88477

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.[2] C01G *23/02*

U.S. Cl. 423—492 **2 Claims**

1. A process for the production of solid purple titanium trichloride suitable for use as a catalyst for polymerization of an alpha-olefin, which comprises:

mixing solid titanium trichloride, an ether and a hydrocarbon solvent selected from the group consisting of aliphatic, alicyclic and aromatic hydrocarbon solvents for reaction to form a homogeneous solution or mixture comprising titanium trichloride, said ether having the generic formula $R^1—O—R^2$, wherein R^1 and R^2 are individually an alkyl or alkenyl group having at least six carbon atoms, and said ether is added in an amount so the molar ratio of ether to titanium trichloride is greater than 1;

mixing said homogeneous solution or mixture and a Lewis acid to form a second mixture, said Lewis acid having higher acidity than titanium trichloride;

heating said second mixture to a temperature within the range of 20°–150° C to form a purple precipitate of titanium trichloride; and

separating said precipitate.

4,115,533
PREPARATION OF SOLID TITANIUM TRICHLORIDE

Kazuo Yamaguchi, Fujisawa; Genjiro Kakogawa; Masayoshi Hasuo, both of Yokohama; Nobuaki Goko, and Yasuo Maruyama, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 600,819, Jul. 31, 1975, Pat. No. 4,060,593. This application Aug. 1, 1977, Ser. No. 820,911

Claims priority, application Japan, Jul. 31, 1974, 49-88476; Jul. 31, 1974, 49-88477

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.[2] C01G *23/02*

U.S. Cl. 423—492 **7 Claims**

1. A process for the production of solid purple titanium trichloride suitable for use as a catalyst for polymerization of an α-olefin, which comprises:

forming a homogeneous solution or mixture comprising titanium trichloride by treating titanium tetrachloride with an organoaluminum compound represented by the generic formula, $AlR^3_nX_{3-n}$, wherein R^3 denotes a hydrocarbon radical of 1 to 20 carbon atoms, *n* is a number of the value of 1 to 3 and X a halogen atom, in the presence of an ether and a hydrocarbon solvent selected from the group consisting of alicyclic and aromatic hydrocarbon solvents;

said ether having the generic formula, $R^1—O—R^2$, wherein R^1 and R^2 are individually an alkyl or alkenyl group and at least one of R^1 and R^2 is an alkyl or alkenyl group having five or less carbon atoms;

heating the thus obtained homogeneous solution or mixture in the presence of a Lewis acid at a temperature in the range of 20°–150° C to cause precipitation of a finely granulated purple solid titanium trichloride; and separating the precipitate.

4,115,534

IN VITRO DIAGNOSTIC TEST

Dionyssis S. Ithakissios, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 715,933, Aug. 19, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 808,339

Int. Cl.² G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 **25 Claims**

1. A method for determining the concentration of substances present in biological fluids comprising the steps of:

providing a mixture of (i) a known quantity of said biological fluid containing said substance whose concentration is to be determined, (ii) a known quantity of a radioactively labeled form of said substance and (iii) a known quantity of magnetically responsive composite microparticles comprising a magnetically responsive material and a permeable, solid, water-insoluble matrix selected from proteinaceous materials, polysaccharides, polyurethanes and mixtures thereof; wherein said magnetically responsive material is dispersed throughout said water-insoluble matrix; and wherein said water-insoluble matrix is capable of sorbing said substances;

reacting said mixture so as to cause said substance and its radioactively labeled form to competitively complex with said composite microparticles;

magnetically separating the complexed microparticles from the mixture;

counting the radioactivity of either the separated complexes or the remaining mixture; and

relating the counted radioactivity to a standard curve to determine the concentration of said substance.

4,115,535

DIAGNOSTIC METHOD EMPLOYING A MIXTURE OF NORMALLY SEPARABLE PROTEIN-COATED PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1977, Ser. No. 809,005

Int. Cl.² G01N *33/16*

U.S. Cl. 424—1 **19 Claims**

1. A diagnostic method for determining the presence or absence of select protein in a liquid sample comprising the steps of:

dispersing a plurality of finely divided inert first particles and a plurality of finely divided inert second particles in the sample liquid, said first particles possessing a property facilitating separation thereof from said sample liquid, said second particles possessing a property facilitating detection thereof, said first and second particles both being coated with protein material specific to said select protein;

separating said first particles from said sample liquid utilizing the separation-facilitating property thereof, and

determining whether a substantial portion of said plurality of second particles have accompanied said separated first particles.

4,115,536

AGENT FOR INTRAVASCULAR ADMINISTRATION

Ulf Sven Erik Rothman, Höllviksnas; Sven Lennart Kägedal, and John Lennart Söderberg, both of Upsala, all of Sweden, assignors to Pharmacia Fine Chemicals AB, Upsala, Sweden

Filed Sep. 10, 1975, Ser. No. 611,942

Claims priority, application Sweden, Sep. 27, 1974, 7412164

Int. Cl.² A61K *29/00, 43/00*

U.S. Cl. 424—1 **2 Claims**

1. An agent for intravascular administration for diagnostic and physiological investigations comprising a suspension of minute particles in a physiologically acceptable liquid, which particles have a particle size of 0.1–300 micrometer and are labelled with at least one metallic radionuclide, said particles being insoluble but swellable in water and comprising hydroxyl group-containing polymer molecules selected from the group consisting of polymeric and polymerized carbohydrates and sugar alcohols and physiologically acceptable derivatives thereof, wherein said particles are covalently bound to a chelate complex composed of at least four, 5-, or 6-membered rings, said complex including said radionuclide and two metal coordinating atoms at a distance of two or three atoms from each other, one of said metal coordinating atoms being a nitrogen atom and the other a nitrogen atom or a sulphur atom or an oxygen atom.

4,115,537

RESIN TABLET AND USE THEREOF IN DIAGNOSTIC TESTS

Richard C. Driscoll, and Clara B. Morejon, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 7, 1976, Ser. No. 720,990

Int. Cl.² G01N *33/16*; A61K *43/00*; C08L *1/00*

U.S. Cl. 424—1 **23 Claims**

12. A competitive binding method for measuring serum T4 comprising the steps of mixing a solution of free T4 extracted from a sample of patient's serum with a dilute buffered solution of known radioisotope-labeled T4 bound to saturated TBG, and separating the unbound T4 with an anion-exchange resin, wherein the improvement comprises

providing said anion-exchange resin in the form of a tablet consisting essentially of polystyrene-based anion-exchange resin beads of 50 to 600 mesh bound together by microcrystalline cellulose, and performing said mixing and separating steps concurrently without incubating the mixed solutions prior to contact with said tablet.

4,115,538

ASSAY KIT FOR CAMP AND/OR CGMP AND METHOD OF USING THE SAME

Tomokazu Satoh; Junichi Takezawa; Akira Kuninaka, all of Choshi; Miyuki Honma, and Michio Ui, both of Sapporo, all of Japan, assignors to Yamasu Shoyu Kabushiki Kaisha, Japan

Filed Feb. 7, 1977, Ser. No. 766,509

Claims priority, application Japan, Feb. 12, 1976, 51-14665

Int. Cl.² G01N *33/16*; A61K *43/00*; B65D *81/32*

U.S. Cl. 424—1 **12 Claims**

12. In a method for assaying cAMP, cGMP or both contained in organisms wherein cAMP, cGMP or both in a sample taken from an organism are succinylated, the succinylated cAMP, cGMP or both are caused to undergo an antigen-antibody reaction with anti-cAMP serum, anti-cGMP serum or both in the presence of succinyl cAMP tyrosine methyl ester, succinyl cGMP tyrosine methyl ester labeled with radioactive iodine, or both which undergo an antigen-antibody reaction with the anti-cAMP serum, anti-cGMP serum or both, the antigen-antibody complex thus formed is separated, and the

radioactivity of the antigen-antibody complex or free antigen is measured thereby to determine the content of cAMP, cGMP or both in the organism based on the radioactivity thus measured, the improvement which comprises the use, as a reaction medium for the antigen-antibody reaction, of an imidazole buffer solution of 0.1 M or higher concentration.

4,115,539
ANALYTICAL OR CLINICAL DERIVATIVES, TAGGED DERIVATIVES AND METHODS OF ANALYSIS USING SUCH DERIVATIVES

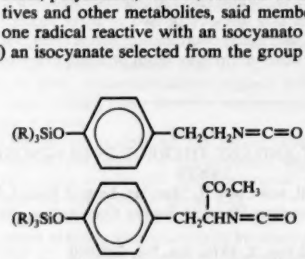
William Anthony Eisenhardt, Jr., Yorktown Heights; Eddie Hedaya, White Plains, and Spyros Theodoropulos, Yorktown Heights, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,149
Int. Cl.[2] A61K *43/00*; G01N *33/00*
U.S. Cl. 424—1 **67 Claims**

1. A composition of matter comprising the reaction product of:

(a) a member selected from the group consisting of steroids, steroidal glycosides, drugs, vitamins, plant and animal hormones, peptides, proteins, amino acids, enzymes, pesticides, polyamines, viruses, bacterial cells, nicotine derivatives and other metabolites, said member having at least one radical reactive with an isocyanato radical, and

(b) an isocyanate selected from the group consisting of



wherein R is a member selected from the group consisting of lower alkyl, alicyclics, aryl, alkaryl and aralkyl, each having no more than about 10 carbon atoms.

4,115,540
RADIODIAGNOSTIC AGENT

George A. Digenis; Manvendra B. Shambhu, both of Lexington, Ky., and Michael C. Theodorakis, Gurnee, Ill., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Jun. 16, 1976, Ser. No. 696,802
Int. Cl.[2] A61K *43/00, 29/00*
U.S. Cl. 424—1 **11 Claims**

1. A method for analyzing the gastrointestinal tract of a human being or animal which comprises orally administering a diagnostic amount of a solid, insoluble non-toxic synthetic resin bearing a detectable amount of Tc 99m thereon, and analyzing the number of radioactive counts given off by the decay of the Tc 99m as said resin passes through the gastrointestinal tract.

4,115,541
BONE-SEEKING TECHNETIUM-99M COMPLEX

Gopal Subramanian, Manlius, and John Gilmore McAfee, Fayetteville, both of N.Y., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 368,473, Jun. 11, 1973, which is a continuation-in-part of Ser. No. 263,171, Jun. 15, 1972, abandoned. This application Mar. 26, 1975, Ser. No. 562,102
Int. Cl.[2] A61K *29/00*; G01T *1/161*; G21H *5/02*; A61K *43/00*
U.S. Cl. 424—1.5 **3 Claims**

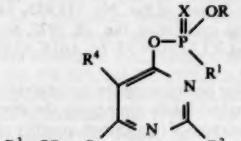
1. A method for skeletal-imaging which includes the intravenous administration of a solution adapted for intravenous administration containing a technetium-99m-tin-phosphonate complex wherein said phosphonate is methylene diphosphonate or 1-aminoethane-1,1-diphosphonate.

4,115,542
O-ALKYL-O-(6-ALKANESULPHONYLOXY-PYRIMIDIN(4)YL)-(THIONO) (THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES AND ARTHROPODICIDAL COMPOSITIONS AND METHODS OF COMBATING ARTHROPODS USING THEM

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,333
Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622501
Int. Cl.[2] A01N *9/36*; C07F *9/65*
U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-O-(6-alkanesulphonyloxypyrimidin(4)-yl)-(thiono)(thiol) phosphoric (phosphonic) acid ester or ester amide of the formula



in which

R is alkyl with 1 to 4 carbon atoms,

R^1 is alkyl, alkylthio, alkoxy or monoalkylamino with in each case 1 to 4 carbon atoms, or phenyl,

R^2 is alkyl, alkoxy or alkylthio with 1 to 3 carbon atoms, dialkylamino with 1 or 2 carbon atoms per alkyl radical, or hydrogen,

R^3 is alkyl with 1 to 3 carbon atoms,

R^4 is hydrogen, halogen, methyl or ethyl, and

X is oxygen or sulphur.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,115,543
IDENTIFICATION OF *NEISSERIA GONORRHOEAE*

Rebecca Wallace, Ottawa; Fraser E. Ashton, Lucerne; Malcolm B. Perry, and Benito B. Diena, both of Ottawa, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Dec. 20, 1976, Ser. No. 752,681
Int. Cl.[2] A61K *31/70, 39/40*; G01N *21/38, 33/16*
U.S. Cl. 424—8 **10 Claims**

1. A method of preparing a reagent comprising antibodies causing agglutination of cells of *Neisseria gonorrhoeae* comprising

(a) providing lipopolysaccharide antigen of the type which is common to *N. gonorrhoeae*, said antigen having the following composition: (weight %)

2-Amino-2-deoxy-D-glucose	13.8
D-Glucose	6.0
D-Galactose	6.9
L-glycero-D-manno-Heptose	3.8
3-Deoxy-D-Manno-octulosonic acid	7.3
Phosphorus	3.6
Total lipid	44.0

-continued

Ethanolamine	Trace
Protein	0.2

(b) inoculating live fowl with this lipopolysaccharide antigen in amounts effective to raise antibodies in the fowl, and

(c) recovering blood serum containing the antibodies from the inoculated fowl.

5. A reagent causing specific agglutination of cells of *Neisseria gonorrhoeae* comprising antiserum or antibodies derived from the antiserum from fowl inoculated with lipopolysaccharide antigen of the type which is common to *N. gonorrhoeae* said antigen being as defined in claim 1.

4,115,544
OCULAR SYSTEM MADE OF BIOERODIBLE ESTERS HAVING LINEAR ETHER

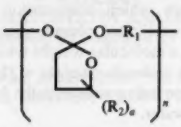
John W. Shell, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 715,519, Aug. 18, 1976, abandoned, which is a division of Ser. No. 592,555, Jul. 2, 1975, Pat. No. 4,001,388, which is a continuation-in-part of Ser. No. 369,916, Jun. 14, 1973, Pat. No. 3,914,402. This application Nov. 10, 1977, Ser. No. 850,275

Int. Cl.[2] A61K *9/14, 9/22, 9/32*

U.S. Cl. 424—14 **4 Claims**

1. An ophthalmic dosage form comprising solid particles of from 0.01 up to 20 parts of an ophthalmic drug admixed with from 0.01 up to 30 parts of a bioerodible drug release rate-controlling orthoester homopolymer of the general formula:



wherein R_1 is a member selected from the group consisting of alkylene of 4 to 12 carbons, a cycloalkylene of 5 to 6 carbons, and an alkyleneoxy of 1 to 7 carbons, R_2 is a lower alkyl of 1 to 7 carbons, a is 0 to 1, and n is greater than 10, said solid particles from 10 to 300 microns in largest dimensions, non-irritating and non-toxic to the eye, with from 1 to 5 parts of said solid particles admixed with a suspension agent and up to 100 parts of an ophthalmically-acceptable liquid medium having a pH acceptable to the eye, and when said liquid dosage form is dispensed to an eye, the solid particles bioerde in response to the environment of the eye at a controlled rate and administer drug over a prolonged period of time.

4,115,545
PHARMACEUTICAL COMPOSITION CONTAINING PROSTADIENOIC ACID FOR REGULATING GASTRIC SECRETION

Ned M. Weinshenker, Sunnyvale, Calif., and Niels H. Anderson, Seattle, Wash., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 570,621, Apr. 23, 1975, Pat. No. 4,055,593, which is a continuation of Ser. No. 117,166, Feb. 19, 1971, abandoned. This application Aug. 11, 1977, Ser. No. 823,811

Int. Cl.[2] A61K *31/22, 31/19;* **A61L** *9/04*

U.S. Cl. 424—45 **2 Claims**

1. A pharmaceutical composition useful for regulating gastric secretion in warm-blooded mammals, said composition comprising 0.1 milligram to 1500 milligrams of 11α,15(S)-bis(-dimethyl',isopropoxy',methyloxy)-9-oxo-5-cis,13-trans-prostadienoic acid mixed with a therapeutically acceptable inert carrier stable in a warm-blooded mammal.

4,115,546
ORAL COMPOSITIONS CONTAINING DEXTRANASE

James David Vidra, Clinton, and Julius Harvey Nachtigal, Colonia, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 557,855, Mar. 12, 1975, Pat. No. 3,991,177, which is a continuation-in-part of Ser. No. 419,343, Nov. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 313,304, Dec. 8, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,442

Int. Cl.[2] A61K *7/28, 37/48, 37/54*

U.S. Cl. 424—50 **4 Claims**

1. A dental cream or gel comprising a carrier material, dextranase having an activity of about 20 to 400 units/mg. protein in amount of about 0.001 to about 5% by weight and a non-toxic compound which provides an effective amount of at least 0.001 percent of stabilizer/activator calcium metal ions, said metal ions being provided from water-soluble salts selected from the group consisting of chlorides and nitrates, namely calcium chloride and calcium nitrate, said metal ions being effective to stabilize said dextranase and activate its dextranase activity.

4,115,547
SUNSCREENING COMPOSITIONS

Peter John Degen, Woodbury Township, Washington County, and Anthony James Lucas, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 492,180, Jul. 26, 1974, Pat. No. 4,002,733. This application Oct. 20, 1976, Ser. No. 734,036

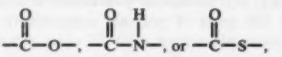
Int. Cl.[2] A61K *7/44*

U.S. Cl. 424—60 **6 Claims**

1. In a sunscreening composition comprising a pharmaceutical extending medium and an effective sunscreening amount of a dermally non-irritating, ultraviolet light-absorbing compound, the improvement wherein the dermally non-irritating, ultraviolet light-absorbing compound is a substantive compound of the formula

$$(XE)_n—R—(AY)_{n^1}$$

Wherein R is the aliphatic portion of polymerized 18-carbon fatty acids and contains 34, 51, 68, 85 or 102 carbon atoms; A and E are independently



X and Y are aromatic, ultraviolet light absorbing moieties characterized by ultraviolet light absorption maxima in the range of 280 nm to about 360 nm, and when $n + n^1$ is greater than 2, Y may be hydrogen or an alkyl radical containing 1 to 6 carbon atoms; *n l and* n^1 are independently integers from 1 to 6 designating different or the same (XE)— and —(AY) respectively, except $n + n^1$ must equal 2–6.

4,115,548
DETERGENT COMPOSITIONS COMPRISING MODIFIED PROTEINS

Robert Anthony Marsh, Newcastle upon Tyne; Gordon John Mackie, Cramlington, and Peter Hale, Whitley Bay, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1974, Ser. No. 534,914

Claims priority, application United Kingdom, Jan. 18, 1974, 2366/74

Int. Cl.[2] A61K *7/06, 7/48, 37/12, 37/16, 37/18*

U.S. Cl. 424—70 **3 Claims**

1. A composition for protecting keratinous material from the deleterious effects of detergent or from adverse climatic conditions, said composition comprising

(a) an effective amount of oxybutylated gelatin, said oxybutylated gelatin having a molecular weight greater than 5,000 and an isoionic point greater than 6;
(b) from 0.1 to 90% by weight of a surface-active agent; and
(c) a compatible carrier.

4,115,549

COATING THE HAIR WITH A HEAT-SETTABLE COMPOSITION

Howard L. Scott, Philadelphia, Pa., assignor to Widner College, Chester, Pa.

Continuation-in-part of Ser. No. 86,597, Nov. 3, 1970, Pat. No. 3,949,764, which is a continuation-in-part of Ser. No. 721,158, Apr. 15, 1968, Pat. No. 3,568,685, which is a continuation-in-part of Ser. No. 386,730, Jul. 31, 1964, abandoned. This application Apr. 13, 1976, Ser. No. 676,616
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.[2] A61K *7/11*
U.S. Cl. 424—71 **4 Claims**

1. A method of treating natural or synthetic hair or fur which comprises coating said hair or fur with an effective amount sufficient to set said hair or fur of a composition comprising a hardening and adhesive agent in either an aqueous or oil media, said hardening and adhesive agent being in a concentration of about 1–85% by volume and being selected form the group consisting of (1) p,p'-methylenedianiline; (2) a copolymer of (a) about 0.5–25% by weight of itaconic acid, (b) 3–4% by weight of at least one polymerizable compound selected from the group consisting of acrylonitrile, alkyl esters of acrylic and methacrylic acids having from 1 to 18 carbon atoms in the alkyl group, phenyl methacrylate, methacrylonitrile, methyl vinyl ketone and vinyl chloride, and (c) 35–96.5% by weight of vinylidene chloride, the proportions being selected to total 100% (3) water insoluble copolymers obtained by the emulsion copolymerization of about 0.5–6 parts by weight of either N-methylolacrylamide, N-methylolmethacrylamide, or mixtures thereof, with about 0.5–25 parts by weight of either acrylamide or methacrylamide, and having a molecular weight of 100,000 to 10,000,000; (4) a copolymer of acrylonitrile and styrene wherein a 50% by weight solution has a viscosity of SX (Gardner Holdt) at 25° C; (5) chlorophyll a having the formula $C_{55}H_{72}MgN_4O_5$ and chlorophyll b which has the formula $C_{55}H_{70}MgN_4O_6$; (6) a vinyl chloride-vinylidene chloride co-polymer; (7) vinyl chloride polymers plasticized with alkyl aryl phosphate plasticizers at levels of 25 and 35 parts per 100 parts of polymer respectively; (8) a vinyl chloride polymer plasticized with 35 parts dioctyl phthalate per 100 parts of polymer; (9) vinyl chloride-acrylic latexes; and (10) vinyl-chloride/butadiene-acrylonitrile polyblend latex.

4,115,550

COMPOSITION FOR LOWERING BLOOD CHOLESTEROL LEVEL

Joseph E. Fields, Ballwin, and John H. Johnson, Kirkwood, both of Md., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 353,832, Apr. 23, 1973, Pat. No. 3,923,972, which is a continuation-in-part of Ser. No. 188,577, Oct. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 789,081, Jan. 2, 1969, abandoned. This application Apr. 29, 1975, Ser. No. 573,281
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.[2] A61K *31/34*
U.S. Cl. 424—78 **24 Claims**

1. An animal feed composition comprising a nutrient ration and an effective blood cholesterol lowering amount of a copolymer of (1) alpha alkene of 10 to about 22 carbon atoms and (2) maleic acid or anhydride, or a pharmaceutically acceptable amide, ester, imide, salt thereof of mixtures thereof, said copolymer having a molecular weight in the range of about 1,000 to about 1,000,000, said cholesterol lowering amount of copolymer being sufficient to lower the blood cholesterol level in a living animal.

4,115,551

COMPOUNDS OF THE PLASMINOGEN TYPE AND METHOD FOR OBTAINING SUCH COMPOUNDS FROM PLACENTAL PULPS

Jean-Claude Lormeau, Maromme-la-Maine; Jean Goulay, Oissel, and Edmond Vairel, Paris, all of France, assignors to Choay S.A., Paris, France

Filed Dec. 17, 1974, Ser. No. 533,631
Claims priority, application France, Dec. 18, 1973, 73 45289
Int. Cl.[2] A61K *35/50*
U.S. Cl. 424—105 **55 Claims**

1. A method for the preparation of an active plasminogen compound capable of activation to plasmin which comprises mechanically reducing frozen placentas to placental pulps, defrosing the resulting pulps, thereby obtaining a fluid mass of placental liquid and solids, separating from the mass of liquid and solids the liquid which contains the fluid placental blood, which liquid contains proteins and plasmins and recovering the placental solids including the pulps, macerating said pulps at a pH between about 5 and about 10 in an aqueous solution of an inhibitor of plasminogen activation to plasmin, removing the pulps, collecting the liquid solution containing the plasminogen compounds, separating said inhibitor of plasminogen activation and recovering the solution of the plasminogen dissolved therein.

13. composition having polasminogen activity capable of activation to plasmin which composition comprises native plasminogen and preactivated plasminogen said preactivated plasminogen having a molecular weight which is of about 7000 to 8000 less than the molecular weight of the native plasminogen, said composition being substantially free of plasmin and soluble in distilled water.

4,115,552

FACTOR A AND B OF ANTIBIOTIC A-4696

Robert L. Hamill, New Ross; William M. Stark, and Donald C. DeLong, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 678,511, Apr. 19, 1976, Pat. No. 4,064,233, which is a continuation-in-part of Ser. No. 533,570, Dec. 17, 1974, Pat. No. 3,952,095, which is a continuation-in-part of Ser. No. 259,334, Jun. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 118,674, Feb. 25, 1971, abandoned. This application Sep. 28, 1977, Ser. No. 837,124
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—118 **2 Claims**

1. Factor A of antibiotic A-4696, **or a pharmaceutically acceptable acid addition salt thereof, which antibiotic in the form of its hydrochloride salt is a white, crystalline substance soluble in water and insoluble in the common organic solvents; has the approximate composition of** 50.21 percent carbon, 5.48 percent hydrogen, 4.96 percent nitrogen, 30.42 percent oxygen, and 6.96 percent chlorine; has a specific rotation, $[\alpha]_D^{25}$ of $-81°$ (c=0.8, H_2O); has an ultraviolet adsorption maximum in acidic and neutral solutions at 282 mμ. with an extinction coefficient $E_{1cm.}^{1\%}$ of 35.9; and has the following distinguishable bands in its infrared absorption spectrum when determined in a mineral oil mull: 3.0 broad, 3.44, 4.25, 4.31, 6.07, 6.20, 6.31, 6.65, 7.04, 7.73, 8.10, 8.21, 8.47, 8.89, 9.43, 9.69, 9.83, 10.14, 11.07, 11.36 and 12.25 microns.

4,115,553
ANTACID TABLETS

Andrew M. Rubino, New Providence, and Jack J. Margres, Old Bridge, both of N.J., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 423,226, Dec. 10, 1973. This application Jun. 24, 1974, Ser. No. 482,431
The portion of the term of this patent subsequent to Sep. 9, 1995, has been disclaimed.
Int. Cl.[2] A61K *33/12, 33/10, 33/08*
U.S. Cl. 424—155 11 Claims

1. An antacid tablet comprising the codried combination of a hydrous gelatinous aluminum hydroxide material with an alcohol, and an excipient therefor, said material being selected from the group consisting of:

(1) basic aluminum bicarbonate-carbonate and

(2) basic aluminum bicarbonate-carbonate in combination with magnesium basic carbonate, magnesium hydroxide, or magnesium trisilioate, or mixtures thereof,

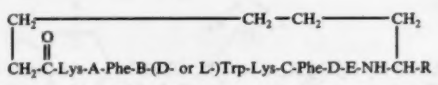
said alcohol being a foodgrade di- or trihydroxy alcohol suitable for oral ingestion, wherein analysis of the codried combination yields a figure of from 30 to 60 weight percent for the sum of the aluminum hydroxide and magnesium hydroxide calculated as Al_2O_3 and MgO and shows that there is present at least 0.3 mole of carbonate calculated as CO_2 for each mole of Al_2O_3, said codried combination being contained in the tablet in an amount of from 10 to 90 weight percent of the tablet.

4,115,554
SOMATOSTATIN ANALOGS

Daniel F. Veber, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 29, 1977, Ser. No. 828,791
Int. Cl.[2] A61K *37/02;* C07C *103/52*
U.S. Cl. 424—177 5 Claims

1. Compounds of the formula:



wherein

R is H, COOH,

A is $(Asn)_n$, α-Abu, Pro, Ala wherein $n = 0$ or 1,

B is Phe, Tyr,

C and D are independently Thr, Val,

E is Ser, Pro, Ala, Gly,

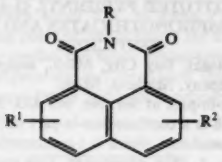
wherein at least one of A and E is Pro and the ring formed by the peptide backbone contains 35 to 38 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,115,555
2-SUBSTITUTED-1H-BENZ[de]-ISOQUINOLINE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 727,836, Sep. 9, 1976, Pat. No. 4,051,246. This application Jul. 5, 1977, Ser. No. 812,886
Int. Cl.[2] A61K *31/70*
U.S. Cl. 424—180 8 Claims

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and R is selected from the group consisting of triacetyl substituted pentose, pentose, tetraacetyl substituted hexose, and hexose.

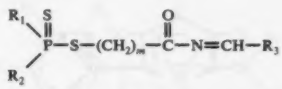
7. A pharmaceutical composition useful for treating inflammation in a mammalian specie comprising as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim 1 and a pharmaceutically acceptable carrier.

4,115,556
CERTAIN FORMAMIDINE DITHIOPHOSPHATES AND PHOSPHONATES AND THEIR USE AS INSECTICIDES

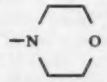
Hsiao Ling Lam, and Eugene G. Teach, both of El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 657,438, Feb. 12, 1976, Pat. No. 4,045,557. This application Jul. 25, 1977, Ser. No. 818,477
Int. Cl.[2] A01N *9/36;* C07D *265/30*
U.S. Cl. 424—200 37 Claims

1. A compound having the formula

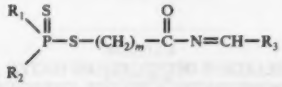


in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, R_3 is

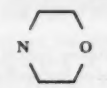


and m is 1 or 2.

20. A method for controlling insects comprising applying to the insect or the habitat thereof an insecticidally effective amount of a compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, R_3 is



and m is 1 or 2.

4,115,557

SUBSTITUTED PYRIDINYL O-ALKYL PHENYL/PHOSPHONOTHIOATES AND THEIR USE AS PESTICIDES

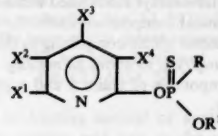
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 649,433, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 568,220, Apr. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 456,943, Apr. 1, 1974, abandoned. This application Apr. 18, 1977, Ser. No. 788,400

Int. Cl.[2] A01N *9/22*; C07D *213/02*

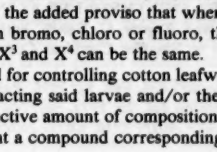
U.S. Cl. 424—200 **68 Claims**

1. A compound corresponding to the formula:



wherein R is phenyl of phenyl being mono- or polysubstituted with bromo, chloro, fluoro or methyl; R^1 represents alkyl or 1 to 4 carbon atoms; and X^1, X^2, X^3 and X^4 each independently represent bromo, chloro, fluoro, trifluoromethyl or hydrogen, with the proviso that at least one of X^1, X^2, X^3 and X^4 is hydrogen; at least one of the others of X^1, X^2, X^3 and X^4 is other than hydrogen; with the added proviso that when X^1, X^2, X^3 or X^4 is selected from bromo, chloro or fluoro, that no more than two of X^1, X^2, X^3 and X^4 can be the same.

47. A method for controlling cotton leafworm larvae which comprises contacting said larvae and/or their habitats with a pesticidally-effective amount of composition containing as the active ingredient a compound corresponding to the formula:



wherein R is phenyl or phenyl being mono- or polysubstituted with bromo, chloro, fluoro or methyl; R^1 represents alkyl of 1 to 4 carbon atoms; and X^1, X^2, X^3 and X^4 each independently represent bromo, chloro, fluoro, trifluoromethyl or hydrogen, with the proviso that at least one of X^1, X^2, X^3 and X^4 is hydrogen; at least one of the others of X^1, X^2, X^3 and X^4 is other than hydrogen; with the added proviso that when X^1, X^2, X^3 or X^4 is selected from bromo, chloro or fluoro, that no more than two of X^1, X^2, X^3 and X^4 can be the same.

4,115,558

HYDRAZONE DITHIOPHOSPHATES AND PHOSPHONATES AND USE THEREOF AS INSECTICIDES

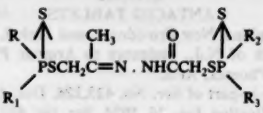
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 20, 1977, Ser. No. 843,999

Int. Cl.[2] A01N *9/36*; C07F *9/40, 9/165*

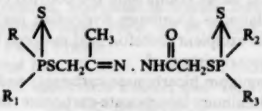
U.S. Cl. 424—205 **21 Claims**

1. A method of controlling insects comprising applying to said insects or the habitat or feedstuff of said insects an insecticidally effective amount of a compound having the general structural formula



in which each of R and R_2 is an alkyl or alkoxy group and each of R_1 and R_3 is an alkoxy group.

15. A compound having the general structural formula



in which each of R and R_2 is an alkyl or alkoxy group and each of R_1 and R_3 is an alkoxy group.

4,115,559

DIPHOSPHORUS DERIVATIVES AND FUNGICIDAL COMPOSITIONS CONTAINING THEM

Guy Lacroix, Lyon; Jean-Claude Debourge, Courbevoie, and Jacques Ducret, Lyon, all of France, assignors to Philagro S.A., France

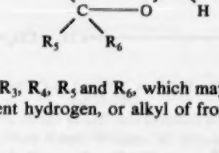
Filed Jan. 30, 1976, Ser. No. 654,052

Claims priority, application France, Feb. 5, 1975, 75 04394

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—209 **11 Claims**

1. A method for controlling the growth of fungus in plants which comprises contacting said plants with a fungicidally effective amount of at least one compound of the formula:



wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, represent hydrogen, or alkyl of from 1 to 5 carbon atoms, and

$n = 0$ or 1;

and wherein R_1 and R_5 when $n = 0$, or R_1 and R_3 when $n = 1$, may together form a phenyl group.

4,115,560

CERTAIN FORMAMIDINE DITHIOPHOSPHATES AND PHOSPHONATES AND THEIR USE AS INSECTICIDES

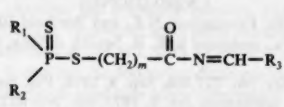
Hsiao Ling Lam, and Eugene G. Teach, both of El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 657,438, Feb. 12, 1976, Pat. No. 4,045,557. This application Jul. 25, 1977, Ser. No. 818,478

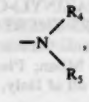
Int. Cl.[2] A01N *9/36*; C07F *9/02*

U.S. Cl. 424—211 **50 Claims**

1. A compound having the formula

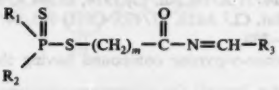


in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, R_3 is



R_4 and R_5 are lower alkyl and *m* is 1 or 2.

30. A method for controlling insects comprising applying to the insect or the habitat thereof an insecticidally effective amount of a compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, R_3 is

R_4 and R_5 are lower alkyl and *m* is 1 or 2.

4,115,561
N-PHENYL-N'METHYL-N''-(O,S-DIALKYLPHOSPHONYL)-1,3,5-TRIAZAPENTA-1,4-DIENES AS PESTICIDES

Manfred Boger, Weil am Rhein, Germany, and Odd Kristiansen, Mohlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

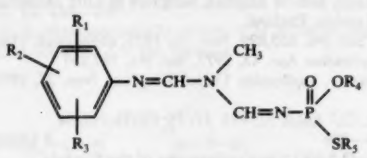
Filed Nov. 14, 1977, Ser. No. 851,327

Claims priority, application Switzerland, Dec. 1, 1976, 15129/76; Feb. 2, 1977, 1242/77; Nov. 3, 1977, 13389/77

Int. Cl.[2] C07F *9/24;* A01N *9/36*

U.S. Cl. 424—211 **17 Claims**

1. A 1,3,5-triazapenta-1,4-diene of the formula



(I)

wherein each of R_1, R_2 and R_3 represents hydrogen, halogen or C_1–C_4 alkyl and each of R_4 and R_5 represents C_1–C_5 alkyl.

17. A method of controlling a variety of animal and plant pests which comprises the use of a 1,3,5-triazapenta-1,4-diene according to claim 1.

4,115,562
TREATED FABRICS AND PROCESS

James T. Gragson, Bartlesville, Okla., and Joseph E. Ballard, Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 591,921, Jun. 30, 1975, Pat. No. 4,029,639. This application Mar. 11, 1977, Ser. No. 776,686

Int. Cl.[2] C08G *75/16;* B29C *25/00*

U.S. Cl. 264—234 **7 Claims**

1. A process for improving the physical properties of fabrics of phenylene sulfide polymer fibers comprising heat treating in a relaxed state a fabric made from phenylene sulfide polymer fibers that have been drawn in the solid state at least about three to about eight times to provide a high degree of orientation and have been produced from polymers having a melt flow within the range of 75 to 800 grams per 10 minutes as measured by ASTM method D-1238-70 modified to operate at 650° F with a piston load of 5 kilograms at an elevated temperature near, but from about 5° C to about 25° C below, the crystalline melting point of the polymer for a finite period of time sufficient to render the fabric water-repellent but under conditions of temperature and time such that the treatment does not cause degradation of physical properties or discoloration of the fabric.

4,115,563
PHARMACEUTICAL STEROID FORMULATION

Phillip Merrill John, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,317

Int. Cl.[2] A61K *31/58*

U.S. Cl. 424—241 **10 Claims**

1. A solid pharmaceutical formulation comprising from 5 to 80 percent by weight of a pharmaceutically active steroid, 1 to 8 percent by weight of sodium starch glycolate and the remainder conventional excipients.

4,115,564
TREATMENT OF DIARRHEA WITH AMIDINOUREAS

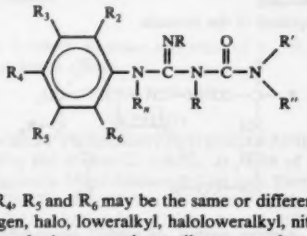
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Paoli, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 558,186, Mar. 13, 1975, Pat. No. 4,025,652. This application Nov. 3, 1976, Ser. No. 738,426

Int. Cl.[2] A61K *31/33, 31/535, 31/425, 31/445*

U.S. Cl. 424—244 **12 Claims**

1. A method for the treatment of diarrhea in humans and mammals which comprises the administering thereto between 0.01 to 500 mg/kg per day of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are: hydrogen, halo, loweralkyl, haloloweralkyl, nitro, loweralkoxy, hydroxy, arloweralkoxy, acyloxy, cyano, haloloweralkoxy or loweralkylsulfonyl;

R and R_n are hydrogen or loweralkyl; and

R' and R'' together form a ring containing a group selected from the group consisting of tetramethylene, pentamethylene and hexamethylene 5–7 atom ring which may additionally include 0–2 hetero atoms of N,O or S; and the non-toxic acid addition salts thereof.

4,115,565
6,7-DIMETHOXY-2-(4-THIOMORPHOLINYL)-4-QUINAZOLINAMINE AND RELATED SULFOXIDE AND SULFONE

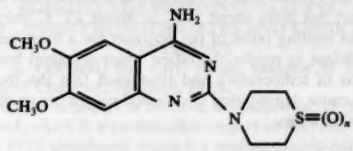
Lawrence D. Wise, and Glenn C. Morrison, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 759,695, Jan. 17, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,755

Int. Cl.[2] A61K *31/505;* C07D *417/04*

U.S. Cl. 424—246 **5 Claims**

1. Compounds of the general formula:



wherein *n* is 0, 1 or 2 and pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition comprising a pharmaceutical acceptable carrier in combination with a pharmaceutically effective amount of a compound or salt according to claim 1.

4,115,566

7α UREIDO CEPHEM-4-CARBOXYLIC ACID DERIVATIVES

Karoly Kocsis, Basel; Bruno Fechtig, Reinach, and Hans Bickel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

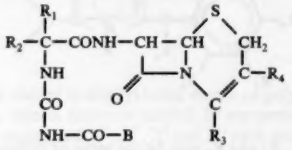
Division of Ser. No. 344,004, Mar. 22, 1973, Pat. No. 3,954,802. This application Dec. 19, 1975, Ser. No. 642,505

Claims priority, application Switzerland, Mar. 29, 1972, 4732/72

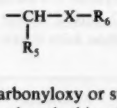
Int. Cl.[2] A61K *31/545*; C07D *501/28*

U.S. Cl. 424—246 **7 Claims**

1. A compound of the formula



wherein R_4 denotes methyl, or methyl mono-substituted by hydroxy, lower alkanoyloxy with up to 6 carbon atoms or a nitrile group, R_3 denotes a carboxyl group, R_1 is hydrogen and R_2 is phenyl, thienyl or furyl and wherein B denotes a group of the formula



wherein X represents carbonyloxy or sulphonyl, R_5 represents hydrogen, lower alkyl, phenyl, thienyl, furyl or pyridyl and R_6 represents (a) lower alkyl or lower alkyl mono-substituted by halogen, lower alkoxy, phenoxy or lower alkanoloxy or (b) phenyl, naphthyl, benzyl, furyl, thienyl, furfuryl, thenyl, pyridyl, pyrazinyl or pyrimidyl or phenyl, naphthyl, benzyl, furyl, thienyl, furfuryl, thenyl, pyridyl, pyrazinyl or pyrimidyl mono substituted by lower alkyl, lower alkoxy, halogen or nitro, or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical preparation with antibacterial activity which comprises a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier.

4,115,567

6-CARBOXY-2-(2'-PYRAZINYL)-CHROMONES AND ESTERS THEREOF

Gianfederico Doria; PierNicola Giraldi; Francesco Lauria; Maria Luisa Corno, all of Milan; Piero Sberze, Varese, and Marcello Tibolla, Milan, all of Italy, assignors to Carlo Erba S. p. A., Milan, Italy

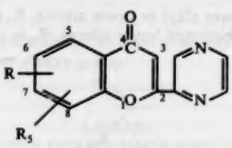
Division of Ser. No. 660,383, Feb. 23, 1976, Pat. No. 4,065,467, which is a continuation of Ser. No. 536,476, Dec. 26, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,488

Claims priority, application Italy, Dec. 27, 1973, 32089 A/73; Jul. 4, 1974, 24777 A/74; Jul. 17, 1974, 25244 A/74

Int. Cl.[2] A61K *31/495*; C07D *405/04*

U.S. Cl. 424—250 **12 Claims**

1. A 5:6-benzo-γ-pyrone compound having the following formula:



wherein

R is carboxy or —$COOR_{13}$, wherein R_{13} is C_1–C_{12} alkyl;

R_5 is hydrogen, allyl or propyl;

the radical R is in the 6- or 7-position of the benzopyrone ring, or a pharmaceutically acceptable salt thereof.

3. An antiallergic pharmaceutical composition comprising a suitable carrier and/or diluent, and, as the active ingredient, a compound of claim 1.

8. A method for prevention and/or treatment of allergic conditions, said method comprising administrating a therapeutically effective amount of a compound of claim 1.

4,115,568

THIENO[3,2-b]-[1,5]BENZODIAZEPINES

Jiban Kumar Chakrabarti, Camberley, and David Edward Tupper, Bracknell, both of England, assignors to Lilly Industries Limited, London, England

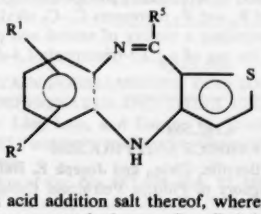
Division of Ser. No. 633,895, Nov. 20, 1975, abandoned. This application Apr. 13, 1977, Ser. No. 787,197

Claims priority, application United Kingdom, Nov. 26, 1974, 51240/74

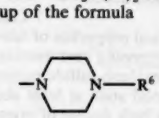
Int. Cl.[2] A61K *31/495, 31/55*; C07D *495/04*

U.S. Cl. 424—250 **9 Claims**

1. A thieno[3,2-b][1,5]benzodiazepine of the formula



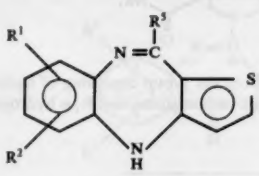
or an acid addition salt thereof, wherein R^1 and R^2 independently represent hydrogen, C_{1-4} alkyl, halogen, C_{1-4} haloalkyl, nitro, amino, C_{1-4} alkoxy, C_{1-4} alkylthio or a group of the formula —$SO_2N(R^4)_2$where R^4 is C_{1-4} alkyl; wherein R^5 is a group of the formula



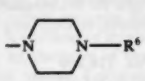
wherein R^6 is hydrogen, phenyl, halo phenyl, C_{1-4} alkyl, C_{1-4} carbalkoxy or —$(CH_2)_nOH$ where *n* is 2 or 3; and wherein the

thiophene ring is unsubstituted or is substituted by a C_{1-4} alkyl group.

7. A pharmaceutical formulation comprising as an active ingredient a chemotherapeutically effective amount of a compound of the formula:



or a pharmaceutically-acceptable salt thereof, wherein R^1 and R^2 independently represent hydrogen, C_{1-4} alkyl, halogen, C_{1-4} haloalkyl, nitro, amino, C_{1-4} alkoxy, C_{1-4} alkylthio or a group of the formula $-SO_2N(R^4)_2$ where R^4 is C_{1-4} alkyl; wherein R^5 is a group of the formula:



wherein R^6 is hydrogen, phenyl, halo phenyl, C_{1-4} alkyl, C_{1-4} carbalkoxy or $-(CH_2)_nOH$ where n is 2 or 3; and wherein the thiophene ring is unsubstituted or is substituted by a C_{1-4} alkyl group.

4,115,569
CYCLIC DIAMINE DERIVATIVES

Rolf-Ortwin Weber, Wiesbaden; Alfons Söder, Frankfurt, Main-Schwanheim, and Istvan Boksay, Kiedrich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

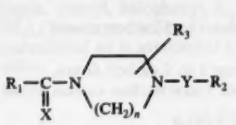
Division of Ser. No. 307,406, Nov. 17, 1972. This application Aug. 21, 1975, Ser. No. 606,488

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1972, 2240665; Nov. 19, 1971, 2157424

Int. Cl.[2] A61K *31/495;* **C07D** *295/10*

U.S. Cl. 424—250 **6 Claims**

1. A pharmaceutically active N,N'-disubstituted cyclic diamine compound of the formula



(I)

wherein

R_1 is an unsubstituted binuclear heterocyclic ring system bound to the group

at a carbon atom and being selected from the group consisting of benzofuryl, dihydrobenzofuryl and benzothienyl,

X is oxygen, sulphur or a NH-group,

Y is an unsubstituted alkylene group having 1 to 3 carbon atoms in the chain or an alkylene group having 1 to 3 carbon atoms in the chain substituted by (a) up to 3 alkyl groups each having up to 3 carbon atoms and a total of not more than 8 carbon atoms, or by (b) one or two phenyl groups,

R_2 is a mononuclear heterocyclic radical selected from the group consisting of (A) furfuryl, tetrahydrofurfuryl and thenyl and (B) substitution products of (A) containing at least one substituent selected from the group consisting of nitro, halogen, trifluormethyl, alkyl having 1 to 6 carbon atoms,

R_3 is hydrogen or up to two substituents selected from alkyl groups having up to 2 carbon atoms and phenyl groups;

n is 2 or 3

or a physiologically-acceptable acid addition salt thereof.

6. A pharmaceutical composition useful for psychotherapeutic treatment comprising as an active ingredient a compound (I) or its pharmaceutically acceptable acid addition salt as claimed in claim 1 together with a compatible adjuvant.

4,115,570
MORPHOLINE COMPOUNDS AND METHODS OF USE

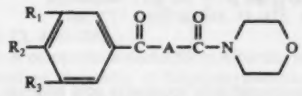
Aldo Garzia, Lodi (Milan), Italy, assignor to Istituto Chemioterapico Italiano, S.p.A., Italy

Filed Feb. 28, 1975, Ser. No. 554,177

Int. Cl.[2] A61K *31/535;* **C07D** *295/18*

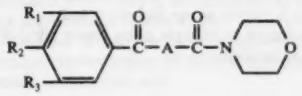
U.S. Cl. 424—248.57 **13 Claims**

1. A compound of the formula



wherein A is lower alkylene and R_1, R_2 and R_3 are lower alkoxy.

6. A method for providing central nervous system depressant activity to a host comprising administering to the host an effective amount to provide the depressant activity of a compound of the formula



wherein A is lower alkylene and each of R_1, R_2 and R_3 is hydrogen or lower alkoxy.

4,115,571
10-(BIS-PYRROLINYL) PHENOXAZINES

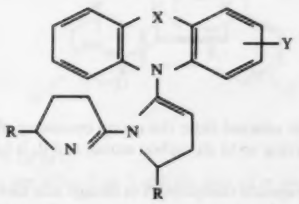
Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 641,007, Dec. 15, 1975, Pat. No. 4,077,959, which is a division of Ser. No. 521,618, Nov. 6, 1974, Pat. No. 3,946,004, which is a continuation-in-part of Ser. No. 336,845, Feb. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 147,667, May 27, 1971, Pat. No. 3,719,671. This application Jan. 13, 1978, Ser. No. 869,201

Int. Cl.[2] A61K *31/535;* **C07D** *413/00*

U.S. Cl. 424—248.56 **9 Claims**

1. A compound selected from the group consisting of 10-(bis-pyrrolinyl)phenoxazines represented by



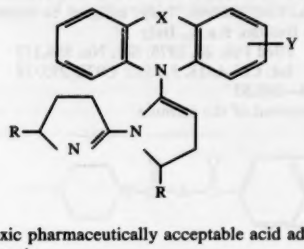
and non-toxic pharmaceutically acceptable acid addition salts thereof wherein

X is oxygen;

Y represents hydrogen, trifluoromethyl, halogen, lower alkyl of from 1 to 4 carbon atoms inclusive or lower alkoxy of 1 to 4 carbon atoms inclusive; and

R represents hydrogen or straight chain lower alkyl of 1 to 4 carbon atoms inclusive.

8. A process for producing a diuretic, smooth muscle relaxant or antithrombogenic effect in a mammal which comprises administering thereto a dose of from about 0.01 to 30 mg./kg. of body weight of said mammal of a compound selected from the group consisting of 10-(bis-pyrrolinyl)phenothiazines, 10-(bis-pyrrolinyl)acridans and 10-(bis-pyrriolinyl)phenoxazines represented by Formula I



and non-toxic pharmaceutically acceptable acid addition salts thereto wherein

X is selected from the group consisting of sulfur, oxygen, or a divalent methylene radical represented by the formula $-C(Z_1Z_2)-$, wherein Z_1 and Z_2 are independently selected from hydrogen or straight chain lower alkyl of from 1 to 4 carbon atoms inclusive;

Y represents hydrogen, trifluoromethyl, halogen, lower alkyl of from 1 to 4 carbon atoms inclusive or lower alkoxy of 1 to 4 carbon atoms inclusive; and

R represents hydrogen or straight chain lower alkyl of 1 to 4 carbon atoms inclusive.

4,115,572
IMIDAZO-[1,5-D]-AS-TRIAZIN-1(2H)-ONES AND METHOD OF AMELIORATING ASTHMA

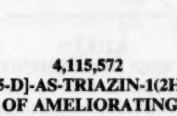
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 765,337, Feb. 3, 1977, abandoned. This application Oct. 18, 1977, Ser. No. 843,302

Int. Cl.[2] C07D *471/04*

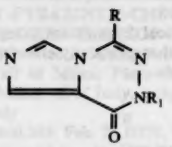
U.S. Cl. 424—249 **14 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen and alkyl having up to six carbon atoms, and R_1 is hydrogen or allyl.

12. A therapeutic composition in dosage unit form useful for meliorating asthma in mammals comprising from about 1.0 mg. to about 25.0 mg. per kg. of body weight per daily dosage unit, in association with a pharmaceutical carrier, of a compound of the formula:



wherein R is selected from the group consisting of hydrogen and alkyl having up to six carbon atoms, and R_1 is hydrogen or allyl.

4,115,573
N-PYRAZINECARBONYL-N'-SUBSTITUTED-SULFAMOYLGUANIDINE AND PROCESSES FOR PREPARING SAME

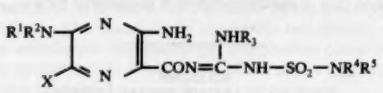
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 4, 1977, Ser. No. 774,360

Int. Cl.[2] A61K *31/495*; C07D *241/02*

U.S. Cl. 424—250 **5 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen,
lower alkyl having from 1 to 5 carbon atoms;
cycloalkyl having from 3 to 6 carbon atoms,
lower alkenyl having from 2 to 3 carbon atoms;

R^2 is hydrogen,
lower alkyl having 1 to 5 carbon atoms;

R^1 and R^2 can be joined to form with the nitrogen atom to which they are attached a heterocyclic ring having 3 to 6 carbon atoms therein;

R^3 is hydrogen,
lower alkyl having from 1 to 5 carbon atoms;

R^4 is hydrogen,
lower alkyl having from 1 to 5 carbon atoms,
cycloalkyl having from 3 to 6 nuclear carbon atoms;

R^5 is hydrogen,
lower alkyl having 1 to 5 carbon atoms,
cycloalkyl having from 3 to 6 nuclear carbon atoms;

X is halogen;

and the pharmaceutically acceptable non-toxic acid addition salts thereof.

4,115,574
BENZODIAZEPINE DERIVATIVES

Jiban Kumar Chakrabarti, Camberley, and David Edward Tupper, Bracknell, both of England, assignors to Lilly Industries Limited, London, England

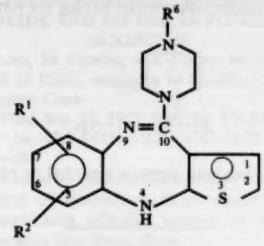
Continuation of Ser. No. 633,895, Nov. 20, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,381

Claims priority, application United Kingdom, Nov. 26, 1974, 51240/74

Int. Cl.[2] A61K *31/495, 31/55*; C07D *495/04*

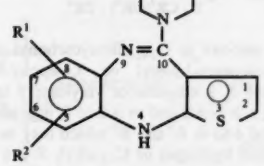
U.S. Cl. 424—250 **21 Claims**

1. A thieno[2,3-b][1,5]benzodiazepine compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 independently represent hydrogen, C_{1-4} alkyl, halogen, C_{1-4} haloakyl, nitro, amino, C_{1-4} alkoxy, C_{1-4} alkylthio or a group of the formula $-SO_2N(R^4)_2$ where R^4 is C_{1-4} alkyl; wherein R^6 is hydrogen, phenyl, halophenyl, C_{1-4} alkyl, C_{1-4} carbalkoxy or $-(CH_2)_nOH$ where n is 2 or 3; and wherein the thiophene ring is unsubstituted or is substituted by a C_{1-4} alkyl group in the 2-position.

8. A method of treating an animal suffering from, or susceptible to, disorder of the CNS, which comprises administering to the animal a chemotherapeutically effective amount of a thieno[2,3-b][1,5]benzodiazepine compound of the formula:



or a pharmaceutically-acceptable salt thereof, wherein R^1 and R^2 independently represent hydrogen, C_{1-4} alkyl, halogen, C_{1-4} haloalkyl, nitro, amino, C_{1-4} alkoxy, C_{1-4} akylthio or a group of the formula $-SO_2N(R^4)_2$ where R^4 is C_{1-4} alkyl; wherein R^6 is hydrogen, phenyl, halophenyl, C_{1-4} alkyl, C_{1-4} carbalkoxy or $-(CH_2)_nOH$ where n is 2 or 3; and wherein the thiophene ring is unsubstituted or is substituted by a C_{1-4} alkyl group in the 2-position.

4,115,575
2-(3-AMINO-2-HYDROXY-PROPOXY)-PYRAZINES

Jörg Frei, Schönenbuch; Knut A. Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Füllinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

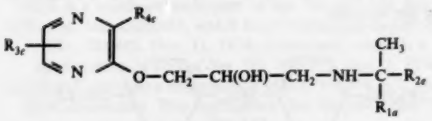
Continuation of Ser. No. 590,363, Jun. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 442,711, Feb. 14, 1974, abandoned. This application Jan. 7, 1977, Ser. No. 757,529

Claims priority, application Switzerland, Feb. 20, 1973, 2444/73; Finland, Jan. 23, 1974, 193/74

Int. Cl.[2] **A61K** *31/495;* **C07D** *241/04, 241/12, 241/18*

U.S. Cl. 424—250 **24 Claims**

1. A compound of the formula



(Iae)

wherein R_{1a} is hydrogen or methyl, R_{2e} is methyl or 2-phenylethyl, R_{3c} is hydrogen, hydroxy, bromine, methyl, 2-methoxyethyl or 2-methoxycarbonylaminoethyl, and R_{4c} is hydrogen, chlorine, methoxy, 2-methoxyethoxy, allyloxy, methylthio, ethylthio, morpholino, 4-hydroxypiperidino, dimethylamino, isopropylamino, phenylthio or N'-methylpiperazino their antipodes or a therapeutically acceptable salt thereof.

11. A pharmaceutical preparation useful as β-receptor blocking agent in the treatment of angina pectoris, hypertonia and disturbances of the rhythm of the heart comprising a therapeutically effective amount of a compound of the formula (Iae) as claimed in claim **1** wherein R_{1a} and R_{2e} have the meanings given, R_{3c} and R_{4c} have the meanings given except for hydrogen or a therapeutically acceptable salt of such a compound together with a pharmaceutically usable excipient.

4,115,576
COMPOSITIONS AND METHOD OF EMPLOYING THE SAME FOR INHIBITING ALCOHOL INTOXICATION

Nathar W. Penn, 453 Glendale Ave., Wyckoff, N.J. 07481

Continuation of Ser. No. 457,226, Apr. 2, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,145

Int. Cl.[2] **A61K** *31/44, 31/455, 31/505*

U.S. Cl. 424—251 **13 Claims**

1. A composition useful for combatting alcohol intoxication consisting essentially of 5-hydroxymethylcytosine, a B_6 vitamin selected from the group consisting of pyridoxal and derivatives or mixtures thereof, and nicotinamide or nicotinic acid, or mixtures thereof, said 5-hydroxymethylcytosine, said B_6 vitamin, and said nicotinamide or nicotinic acid being present in said composition in the molar ratio 1–6: 1–10: 1–10, respectively.

2. A method of combatting alcohol intoxication in a subject which comprises administering to the subject a composition in accordance with claim **1**, the components of said composition being administered to said subject in an amount in milligrams per kilogram of subject body weight in the range 10–30 5-hydroxymethylcytosine, 10–30 said B_6 vitamin, and 7–30 nicotinamide or nicotinic acid.

4,115,577
PYRIDOPYRROLOBENZHETEROCYCLES

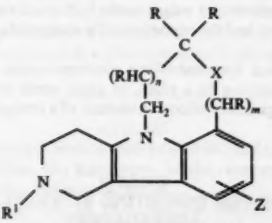
Parthasarathi Rajagopalan, Westbury, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Division of Ser. No. 586,746, Jul. 13, 1975, Pat. No. 4,013,652, which is a division of Ser. No. 357,528, May 7, 1973, Pat. No. 3,914,421, which is a continuation-in-part of Ser. No. 263,766, Jun. 9, 1972, abandoned. This application Dec. 28, 1976, Ser. No. 755,121

Int. Cl.[2] **C07D** *495/22;* **A61K** *31/44*

U.S. Cl. 424—256 **9 Claims**

1. Compound of the formula:



where

X is S, S or SO_2;

m and n are either 0 or 1 and the sum of m and n is at least 1;

the R's are the same or different and are H or CH_3, and one of them can be C_7–C_9 alkyl, phenyl, C_7–C_{10} phenylalkyl, furyl, thienyl, pyridyl, phenyl or C_7–C_{10} phenylalkyl substituted on adjacent ring carbon atoms with methylenedi-

oxy, or phenyl or C_7–C_{10} phenylalkyl substituted on the ring with 1, 2 or 3 substituents individually selected from methoxy, ethoxy, bromine, chlorine, fluorine, trifluoromethyl and C_1–C_4 alkyl; when X is S and *m* is 0, one R on the group —RCR— can be $—OCH_3$; and when X is S and *m* is 1, the R on the group $(CHR)_m$ can be $—OCH_3$;

R^1 is hydrogen, C_1–C_4 alkyl, C_3–C_5 alkenyl, C_3–C_5 alkynyl, C_3–C_6 cycloalkyl, C_2–C_4 alkoxycarbonyl, trifluoroacetyl or substituted C_1–C_4 alkyl where the substituent is C_3–C_6 cycloalkyl, phenyl, phenyl substituted on adjacent carbon atoms with methylenedioxy, or phenyl substituted with 1, 2 or 3 substituents individually selected from methoxy, ethoxy, bromine, chlorine, fluorine, trifluoromethyl and C_1–C_4 alkyl; and

Z is H, Cl or CH_3;

and their pharmaceutically suitable salts.

9. A pharmaceutical preparation suitable for use in warm-blooded animals consisting essentially of a pharmaceutically suitable vehicle and an effective sedative amount of the compound of claim 1.

4,115,578
1-SUBSTITUTED ARALKYL IMIDAZOLES

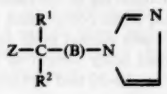
George A. Miller, Maple Glen, and Ronald P. Owen, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 642,041, Dec. 8, 1975, which is a continuation-in-part of Ser. No. 547,291, Feb. 5, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,440

Int. Cl.² C07D *233/58*; A61K *31/415*

U.S. Cl. 424—273 R 6 Claims

1. A compound of the formula



wherein Z is phenyl or phenyl substituted with up to three substituents selected from the group consisting of chloro, fluoro, bromo, iodo, $(C_1$–$C_4)$alkyl, methoxy, ethoxy, nitro, amino, methylthio, and trihalomethyl; R^1 is hydrogen; $(C_1$–$C_{10})$alkyl; $(C_2$–$C_{12})$-alkenyl; $(C_7$–$C_9)$aralkyl the aryl portion of which is substituted with up to two substituents selected from the group consisting of $(C_1$–$C_4)$alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino, methylthio and trihalomethyl; phenyl or phenyl substituted with up to two substituents selected from the group consisting of $(C_1$–$C_4)$alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino, methylthio and trihalomethyl; $(C_3$–$C_7)$cycloalkyl; or $(C_5$–$C_7)$-cycloalkenyl; R^2 is phenyl or phenyl substituted with up to three substituents selected from the group consisting of chloro, fluoro, bromo, iodo, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylthio and trihalomethyl; B is a divalent $(C_1$–$C_3)$-alkylene group and the agronomically acceptable acid addition salts thereof.

3. A method for controlling phytopathoenic fungi which comprises applying to a plant, to plant seeds or to the plant habitat a fungicidally effective amount of a compound of claim 1.

4,115,579
PROCESS FOR INHIBITING BLOOD PLATELET AGGREGATION

Joseph Strubbe, Dilbeek, Belgium, assignor to U C B, Societe Anonyme, Belgium

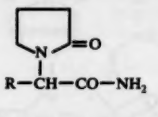
Filed Oct. 19, 1977, Ser. No. 843,693

Claims priority, application United Kingdom, Oct. 19, 1976, 43300/76

Int. Cl.² A61K *31/40*

U.S. Cl. 424—274 6 Claims

1. A process of inhibiting blood platelet aggregation, which comprises administering internally to a man requiring such inhibition an amount effective to inhibit platelet aggregation of a 2-(2-oxo-pyrrolidino)alkanamide having the formula



wherein R is a hydrogen atom or a methyl or ethyl radical.

4,115,580
3,4-EPOXY-CYCLOPENTA-1,2-DIYL PROSTANES

Jean Bowler, and Graham Ernest Robinson, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

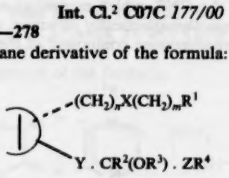
Filed Jul. 18, 1977, Ser. No. 816,666

Claims priority, application United Kingdom, Aug. 11, 1976, 33382/76

Int. Cl.² C07C *177/00*

U.S. Cl. 424—278 10 Claims

1. A prostane derivative of the formula:



I

wherein R^1 is carboxy or C_{2-12} alkoxycarbonyl and D is 3,4-epoxy-5-oxocyclopenta-1,2-diyl or 3,4-epoxy-5-hydroxycyclopenta-1,2-diyl, X is ethylene or vinylene; Y is ethylene or trans-vinylene; *n* is 1 or 2 and *m* is 2 to 5, provided that *n* and *m* together total 4 to 6; R^2 and R^3 which may be the same or different are each hydrogen or C_{1-4} alkyl; Z is a direct bond, C_{1-3} alkylene or C_{1-3} alkyleneoxy, in which the oxygen is bonded to R^4; and R^4 is phenyl or naphthyl optionally bearing one or more substituents selected from halogen, nitro, hydroxy and phenyl, and C_{1-4} alkyl, alkoxy and halogenoalkyl; and for those compounds wherein R^1 is carboxy, the pharmaceutically or veterinarily acceptable salts thereof.

9. A pharmaceutical or veterinary luteolytic composition which comprises an effective amount of the prostane derivative of claim 1 and a pharmaceutically or veterinarily acceptable diluent or carrier.

4,115,581
BIS-STANNANE INSECTICIDES

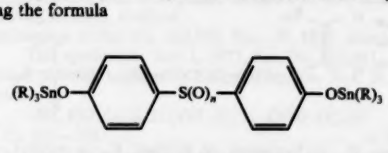
Alexander Mihailovski, Kensington, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 9, 1977, Ser. No. 858,984

Int. Cl.² A01N *9/00*

U.S. Cl. 424—288 7 Claims

1. A method of controlling insects comprising applying to said insects an insecticidally effective amount of a compound having the formula



in which R is cyclohexyl or alkyl having 2 to 6 carbon atoms, and *n* is 0, 1, or 2.

4,115,582
N-1,1,2,2-TETRACHLORO-2-FLUOROETHYLTHIO BENZANILIDE AND ITS USE AS FUNGICIDE AND ACARICIDE

Hsiao-Ling Lam, El Cerrito, and Ferenc M. Pallos, Walnut Creek, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 15, 1977, Ser. No. 833,525
Int. Cl.[2] A01N *9/12*; C07C *69/76*
U.S. Cl. 424—298 4 Claims

1. N-1,1,2,2-tetrachloro-2-fluoroethylthio benzanilide.

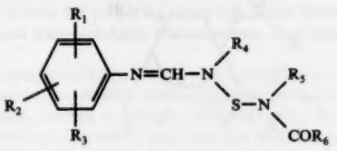
3. A method of controlling fungi comprising applying thereto a fungicidally effective amount of N-1,1,2,2-tetrachloro-2-fluoroethylthio benzanilide.

4,115,583
PESTICIDAL SULPHENYLATED FORMAMIDINE COMPOUNDS

Manfred Böger, Weil am Rhein, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 646,814, Jan. 6, 1976, abandoned. This application May 2, 1977, Ser. No. 792,754
Claims priority, application Switzerland, Jan. 16, 1975, 534/75; Jun. 26, 1975, 8310/75; Nov. 7, 1975, 14425/75
Int. Cl.[2] C07C *145/04*; A01N *9/12*
U.S. Cl. 424—300 20 Claims

1. A compound of the formula I



(I)

wherein

R_1, R_2 and R_3 independently of one another represent hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, trifluoromethyl, cyano or nitro,

R_4 represents C_1–C_4-alkyl,

R_5 represents an C_1–C_{10}-alkyl, halogen substituted C_1–C_{10}-alkyl; C_3–C_{10}-cycloalkyl, C_4–C_{10}-(cycloalkylalkyl) or C_2–C_{10}-(alkoxyalkyl) and

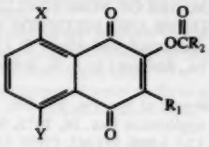
R_6 represents C_1–C_{10}-alkoxy; C_3–C_{10}-cycloalkoxy, C_4–C_{10}-(cycloalkylalkoxy) or C_2–C_{10}-(alkoxyalkoxy).

4,115,584
SUBSTITUTED 2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS AND THEIR USE AS MITICIDES

Russell Frank Bellina, Wilmington, and Dennis Lynn Fost, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 671,044, Mar. 29, 1976, Pat. No. 4,070,481, which is a continuation-in-part of Ser. No. 613,553, Sep. 15, 1975, Pat. No. 4,055,661, which is a continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation of Ser. No. 468,692, May 10, 1974, abandoned. This application Oct. 12, 1977, Ser. No. 841,453
Int. Cl.[2] A01N *9/24*; C07C *69/96*
U.S. Cl. 424—301 9 Claims

1. A compound of the formula:



wherein

R_1 is alkyl of 8–14 carbon atoms which are branched, cyclic or straight chain;

R_2 is alkoxy of 1–4 carbon atoms;

X is hydrogen, fluorine, chlorine, bromine, methyl or methoxy; and

Y is hydrogen, fluroine, chlorine, bromine, methyl or methoxy;

provided that at least one of X and Y is other than hydrogen.

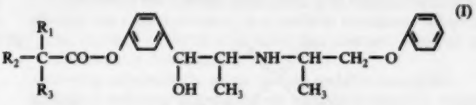
4. A method for protecting plants from mites or aphids which comprises applying to the plant a miticidally or aphicidally effective amount of a compound of claim 1.

4,115,585
ESTERS OF 1-(P-HYDROXYPHENYL)-2-(1'-METHYL-2'-PHENOXYETHYLAMINO)-1-PROPANOL

Elso Manghisi, Monza (Milan); Aldo Salimbeni, Milan, and Giovanni Ferni, Cusano Milanino (Milan), all of Italy, assignors to Instituto Luso Farmaco d'Italia S.r.l., Milan, Italy

Filed May 10, 1977, Ser. No. 795,543
Claims priority, application Italy, May 17, 1976, 23347/76; Mar. 28, 1977, 21735/77
Int. Cl.[2] A61K *31/24*; C07C *93/26*
U.S. Cl. 424—311 5 Claims

1. An ester of 1-(p-hydroxyphenyl)-2-(1'-methyl-2'-phenoxyethylamino)-1-propanol of formula I:



(I)

in which R_1, R_2, and R_3 are alkyl groups of from 1 to 4 carbon atoms, or a pharmaceutically acceptable salt thereof.

3. A vasodilating composition containing a vasodilating effective amount of 1-(p-α,α-dimethylpropionyloxyphenyl)-2-(1'-methyl-2'-phenoxyethylamino)-1-propanol together with a pharmaceutically acceptable expipient.

4. Method for effecting vasodilation in a patient which comprises administering to said patient a vasodilating amount of a pharmaceutical composition having as active ingredient 1-(p-α,α-dimethylpropionyloxyphenyl)-2-(1'-methyl-2'-phenoxyethylamino)-1-propanol in a pharmaceutically acceptable excipient.

4,115,586
ANTIHYPERTHERMIC USE FOR PROSTAGLANDINS

William L. Miller, Jr., Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 18, 1977, Ser. No. 816,398
Int. Cl.[2] A61K *31/19, 31/215*
U.S. Cl. 424—317 9 Claims

1. A method of preventing or ameliorating fever in a human susceptible to fever development, such susceptibility being by virtue of pyrogen or fever-inducing prostaglandin challange, which comprises administering a hypothermic dose of a hypothermic-prostaglandin (hypothermic-PG) to ameliorate said fever or administering prior to said challenge to prevent said fever.

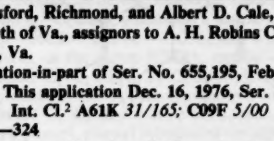
4,115,587

FATTY ACID AMIDES OF NORFENFLURAMINE AND COMPOSITIONS AND METHODS THEREOF

Carl D. Lunsford, Richmond, and Albert D. Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 655,195, Feb. 4, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,294
Int. Cl.[2] A61K *31/165;* C09F *5/00*
U.S. Cl. 424—324 21 Claims

1. A fatty acid amide of norfenfluramine having effective cholesterol-lowering activity in mammals of the formula:



wherein R is selected from the group consisting of alkyl having 12 to 22 carbon atoms and alkenyl having 12 to 22 carbon atoms.

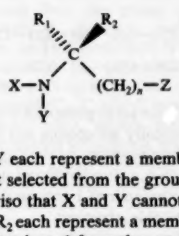
4,115,588

ANTIBACTERIAL NOVEL SOFT N-CHLOROAMINO ALCOHOL DERIVATIVES

James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 632,012, Nov. 14, 1975, Pat. No. 4,036,843. This application Jun. 6, 1977, Ser. No. 803,868
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—325 9 Claims

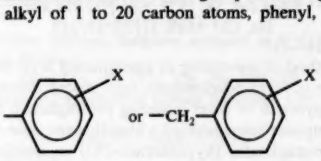
1. A method for inhibiting bacterial growth which comprises applying to said bacterial growth, an antibacterially effective amount of a compound having the formula:



(I)

wherein X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously; R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of n- or branched alkyl of from 1 to 20 carbon atoms, phenyl, naphthyl, or

wherein *m* represents an integer of from 2 to 5; *n* represents an integer of 1 to 8; and Z represents —OR_3, wherein R_3 represents a member selected from the group consisting of n- or branched alkyl of 1 to 20 carbon atoms, phenyl, naphthyl, benzyl,



wherein X is halogen.

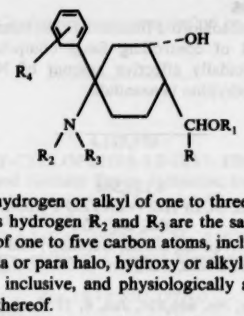
4,115,589

COMPOUNDS, COMPOSITIONS AND METHOD OF USE

Daniel Lednicer, Evansville, Ind., assignor to The Upjohn Company, Kalamazoo, Mich.

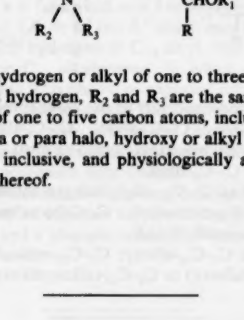
Filed May 17, 1977, Ser. No. 797,782
Int. Cl.[2] A01N *9/20;* C07C *91/02*
U.S. Cl. 424—330 15 Claims

1. A compound of the formula



wherein R is hydrogen or alkyl of one to three carbon atoms, inclusive, R_1 is hydrogen R_2 and R_3 are the same or different and are alkyl of one to five carbon atoms, inclusive; and R_4 is hydrogen, meta or para halo, hydroxy or alkyl of one to three carbon atoms, inclusive, and physiologically acceptable acid addition salts thereof.

11. A method for inducing analgesia in mammals in need of such treatment which comprises administering to said mammal an analgetically effective amount of a compound of the formula



wherein R is hydrogen or alkyl of one to three carbon atoms, inclusive, R_1 is hydrogen, R_2 and R_3 are the same or different and are alkyl of one to five carbon atoms, inclusive; and R_4 is hydrogen, meta or para halo, hydroxy or alkyl of one to three carbon atoms, inclusive, and physiologically acceptable acid addition salts thereof.

4,115,590

BINUCLEAR PHENOLS FOR REDUCING PLASMA LIPID LEVELS

Sidney I. Lerner, Cincinnati, Ohio, assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 347,357, Feb. 26, 1964, abandoned. This application Jan. 28, 1970, Ser. No. 6,588
Int. Cl.[2] A61K *31/05, 31/10, 31/105, 31/19*
U.S. Cl. 424—337 16 Claims

9. A method for lowering serum cholesterol in an animal comprising administering orally to an animal a compound selected from the group consisting of 4,4'-thiobis(6-tert-butyl-m-cresol), 4,4'-thiobis(6-tert-butyl-o-cresol), and α,α'-thiobis(2,6-di-tert-butyl-p-cresol) in a daily dosage of from about 0.8 to about 1,000 milligrams of compound per kilogram of animal body weight.

4,115,591

PROCESS FOR PRODUCING KOJI AND UTILIZATION OF THE KOJI

Fumio Noda, Kamagaya; Keitaro Mogi, and Toshio Sakasai, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co. Ltd., Noda, Japan

Filed Apr. 26, 1977, Ser. No. 790,870
Claims priority, application Japan, Apr. 27, 1976, 51-47298
Int. Cl.[2] A23L *1/20, 1/238*
U.S. Cl. 426—7 8 Claims

1. In a process for producing koji for fermented food products which comprises inoculating a koji mold in a modified koji substrate and cultivating it at a temperature of 20° to 40° C. for a time sufficient to produce koji for fermented food products, the improvement wherein the cultivation is carried out in the presence of 0.05 to 8% by weight, based on the total weight of the unmodified koji substrate, of a sodium or potassium salt of an aliphatic carboxylic acid containing up to 4 carbon atoms.

4,115,592

INSTANT DISSOLVING EGG WHITE

Dwight H. Bergquist, Springfield, Mo.; Franklin E. Cunningham, Manhattan, Kans., and Robert M. Eggleston, Winnipeg, Canada, assignors to Henningsen Foods Inc., White Plains, N.Y.

Continuation of Ser. No. 89,045, Nov. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 670,405, Sep. 25, 1967, abandoned. This application Jun. 13, 1975, Ser. No. 586,653
Int. Cl.[2] A23B *5/06*
U.S. Cl. 426—32 10 Claims

1. Process for preparing dried egg white having improved flow and water solubility characteristics consisting of the steps of:

(a) spray coating dried egg white particles with an aqueous solution of sucrose containing between about 40 and about 80% sucrose by weight while agitating the particles to form a substantially complete and uniform sucrose coating over said particles, the resulting coating comprising from about 15 to about 35% of the total weight of the coated particles, on a dry basis;

(b) sifting the coated egg white particles to prevent formation of clumps; and

(c) drying the still substantially completely coated particles to reduce the moisture content thereof to about 3 to 6% by weight.

4,115,593

PROCESS FOR PRODUCING FEED PROTEIN

Dick Peter Henry, Brookfield, Australia, assignor to The University of Queensland, St. Lucia, Australia

Continuation of Ser. No. 744,338, Nov. 23, 1976, abandoned, which is a continuation of Ser. No. 621,577, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 476,838, Jun. 6, 1974, abandoned. This application Jan. 4, 1978, Ser. No. 866,909
Claims priority, application Australia, Jun. 6, 1973, 3561/73; Apr. 22, 1974, 7314/74
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—53 4 Claims

1. A process for producing yeast protein including the following steps:

(a) subjecting biological waste material to anaerobic fermentation in a liquid medium to provide a yeast growth promoting substrate comprised of a mixture of volatile monocarboxylic acids;

(b) introducing into the resultant ferment a pellicle-forming yeast selected from the group consisting of *Candida ingens* and *Pichia membranaefaciens;*

(c) adjusting the ammonia nitrogen content of said liquid medium to a total nitrogen content of between 0.4% and 2.0% by weight of dry matter;

(d) allowing a surface layer of said yeast to grow on said liquid medium;

(e) gently circulating said medium beneath said surface layer without disturbing or breaking up said layer;

(f) skimming off said layer; and

(g) drying said skimmed yeast to form said yeast protein.

4,115,594

EXTRUDABLE COLLAGEN CASING AND METHOD OF PREPARATION

Thomas Engel Higgins, Brookfield; Camilla Brems Ross, Hinsdale, and Henry John Snella, Oak Forest, all of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,959
Int. Cl.[2] A22C *13/00*
U.S. Cl. 426—140 8 Claims

1. An extrudable collagen mass comprising an additive of polyoxyethylene sorbitan ester selected from the group consisting of polyoxyethylene (20) sorbitan monostearete and polyoxyethylene (20) sorbitan monoleate, in an amount between about 0.05 to about 2 percent based upon the total weight of the collagen mass.

4,115,595

PROCESS FOR COLORING MARASCHINO CHERRIES WITH NATURAL COLORS

J. Kirk Jordan, Lombard, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 851,357
Int. Cl.[2] A23L *1/275*
U.S. Cl. 426—250 15 Claims

1. Process for dyeing fruit or vegetable food with oxidation-sensitive, water soluble plant extract natural colors, said process comprising:

adjusting the SO_2 content of the food, if necessary, to a maximum of 30 ppm;

adjusting the pH of the food, if necessary, to a value below 7.0;

placing the food and water in a sealable container, wherein the amount of water is at least that amount required to substantially cover said food;

removing substantially all air in said sealable container;

adding a coloring amount of an oxidation-sensitive water soluble plant extract natural color to said water;

thereafter sealing said sealable container while excluding air therefrom; and

permitting said food to be exposed to said natural color in said container at a temperature below 100° F. at least for a time sufficient to dye the food the desired color.

4,115,596

METHOD FOR REDUCING THE TEMPERATURE OF BAKERY PRODUCTS

Leif Brudal Knutrud, Jar, Norway, assignor to Norsk Cerealinstitutt ved Statens Teknologiske Institutt, Oslo, Norway

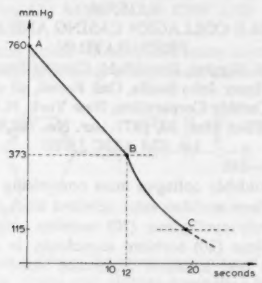
Continuation-in-part of Ser. No. 541,944, Jan. 17, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,452
Claims priority, application Norway, Jan. 18, 1974, 740166
Int. Cl.[2] A21D *13/00, 15/02*
U.S. Cl. 426—497 4 Claims

1. A process for rapid vacuum cooling of hot bakery products, immediately after the discharge thereof from an oven, to a temperature suitable for packaging said bakery products, and for forming said bakery products with a relatively thick and crisp crust without bursting said crust, said process consisting essentially of:

subjecting bakery products, immediately after the completion of baking and discharge thereof from an oven at atmospheric pressure, and without subjecting said bakery products to a deliberate initial air cooling operation, to a first pressure reduction which is substantially linear as a function of time at a rate of from 10 to 60 mm Hg per

second, thereby preventing bursting of the crust of said bakery products; and

immediately thereafter subjecting said bakery products to a second non-linear pressure reduction at an increased rate, and reducing the pressure to a value corresponding to the vapor pressure of a desired temperature suitable for packaging said bakery products;



the reduction of pressure during said first pressure reduction comprising at least half the total reduction of pressure of said first and second pressure reductions; and wherein substantially all of the cooling of the bakery products is done by using a vacuum to subject the bakery products to reduced pressures.

4,115,597

METHOD FOR MAINTAINING UNIFORM LEVEL OF ANTI-OXIDANT IN HEATED COOKING OIL

Marshall Pellar, 1550 via Corona, La Jolla, Calif. 92037

Filed Dec. 29, 1976, Ser. No. 755,244

Int. Cl.² A23L *3/34*

U.S. Cl. 426—541 **4 Claims**

1. The method of dispersing anti-oxidant directly into cooking oil in a cooking vessel, the method comprising the steps of:

providing a cooking vessel containing a quantity of cooking oil at an elevated temperature sufficient to effect deep fat cooking,

providing a supply of anti-oxidant as an aqueous emulsion, and introducing said anti-oxidant aqueous emulsion directly into said cooking oil, said anti-oxidant aqueous emulsion having a specific gravity sufficient to cause the anti-oxidant aqueous emulsion to pass directly into the heated cooking oil thereby vaporizing water and creating turbulence within the heated cooking oil that disperses the anti-oxidant throughout the cooking oil, said anti-oxidant aqueous emulsion added at a rate sufficient to maintain a dispersed effective level of anti-oxidant in the heated cooking oil.

4,115,598

PHASE INVERTING LOW FAT SPREADS

David Patrick Joseph Moran, Potters Bar, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 739,825, Nov. 8, 1976, abandoned. This application Jun. 8, 1977, Ser. No. 804,661

Claims priority, application United Kingdom, Nov. 7, 1975, 46217/75

Int. Cl.² A23D *3/00*

U.S. Cl. 426—604 **13 Claims**

1. A water-in-oil emulsion which destabilizes at body temperature comprising:

(a) 50 to 65 percent by weight of a dispersed aqueous phase, wherein said phase has a pH value of 4 to 6;

(b) 50 to 35 percent by weight of a continuous fat phase, wherein said fat has:

(i) a solids content of 10 to 35 percent at all temperatures from 10° to 20° C,

(ii) a difference in solids content at 10° and 20° C of no greater than 10 percent, and

(iii) a solids content at 30° C of less than 5 percent at least 10 percent less than the solids content at 20° C; and

(c) an emulsifier system comprising:

(i) 0.1 to 0.8 percent by weight of said emulsion of a partial glyceride emulsifier, wherein said partial glyceride emulsifier has an iodine value of 20 to 100, and

(ii) an amount sufficient of an oil-in-water promoting emulsifier to give the emulsion a phase instability temperature of 20° to 35° C.

4,115,599

PROCESS FOR PRODUCING GLASS ARTICLE HAVING FRAGMENT RETAINING AND ALKALI RESISTANT COATING

Lynn J. Taylor, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 521,217, Nov. 6, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,616

Int. Cl.² B32B *17/10*; B05D *3/02*

U.S. Cl. 427—55 **4 Claims**

1. A process for applying a flexibilized epoxy coating to a glass substrate, said coating having glass fragment-retentive properties and alkali-resistance, which process comprises

applying a chemically convertible liquid coating composition to the surface of a glass substrate and then converting the liquid composition to a solid, protective polymeric film by the application of energy,

the chemically convertible coating composition consisting of the following ingredients:

(1) an epoxy resin derived from Bisphenol A and epichlorohydrin;

(2) a flexibilizing aliphatic diepoxide or polyepoxide resin having a flexible molecular structure selected from the group consisting of aliphatic hydrocarbon and polyether chains joining terminal epoxide groups;

(3) a polyether-free, flexibilizing aliphatic diamine or polyamine curing agent having at least two amino groups and having a flexible molecular structure and being present in an amount ranging from 0.80 to 1.25 times the stoichiometric amount calculated from the equivalent weights of said Bisphenol-A derived epoxy resin and flexibilizing epoxy resin, said stoichiometric amount of curing agent being the minimum quantity required to completely react with all of the epoxy groups of both epoxy resins; and

(4) a silane coupling agent.

4,115,600

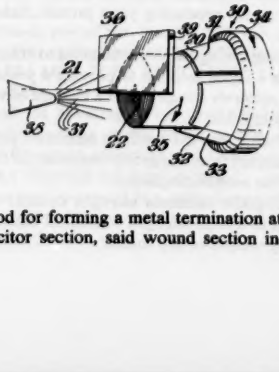
METHOD FOR FORMING A METAL TERMINATION ON A WOUND CAPACITOR SECTION

Walter W. Schroeder, Williamstown; Noel C. Sears, Dalton, and Joseph C. Boni, Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 1, 1977, Ser. No. 783,927

Int. Cl.² H01G *7/00*; B05D *5/12*

U.S. Cl. 427—79 **8 Claims**



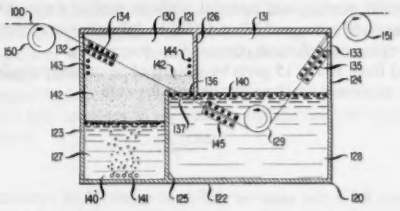
1. A method for forming a metal termination at an end of a wound capacitor section, said wound section including two

metal electrodes being spaced by dielectric layers, one of said electrodes extending outwardly from the other of said electrodes at an end of said section, said dielectric layers being selected from polypropylene, polyethyleneterephthalate, polycarbonate, polystyrene and fluorocarbons, comprising (a) rotating said section about an axis that is parallel to the axis of said wound section; (b) placing a shield plate adjacent to and spaced from said end of said wound section; and (c) spraying a molten metal onto said section end during said rotating, said placing including offsetting said shield plate with respect to said axis of rotation to expose each region of said section end to said sprayed metal for less than the full period of a revolution of said rotation whereby said shield plate allows each region of said section end to undergo some periodic cooling during a complete revolution of said section.

4,115,601
FLEXIBLE CIRCUIT REFLOW SOLDERING PROCESS AND MACHINE

Hans Hugo Ammann, Chester, and Michael Ackman Oien, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 1, 1977, Ser. No. 812,230
Int. Cl.² B05D *3/04, 1/42*
U.S. Cl. 427—96 **10 Claims**



1. A process for reflowing solder plated flexible circuits comprising:

introducing said flexible circuits into a first chamber having a vapor diffusion trap at an entry port and a liquid seal at an exit port;

controlling, in said first chamber, the temperature of said flexible circuits to a point below the solder eutectic temperature;

positioning said flexible circuits in a planar orientation for entry into a second chamber, containing a condensing vapor, at a point below the vapor air interface, said condensing vapor being partially confined in said second chamber by said liquid seal;

exposing said flexible circuits to said condensing vapor in said second chamber for a time sufficient to melt and reflow said solder while maintaining on said flexible circuits a condensate film to subsequently evaporatively cool said flexible circuits below the solder eutectic temperature;

recapturing residual traces of condensate on said flexible circuits; and

removing said flexible circuits through an exit port.

4,115,602
METHOD OF REPRINTING ON A PRINT REMOVABLE PAPER PRODUCT

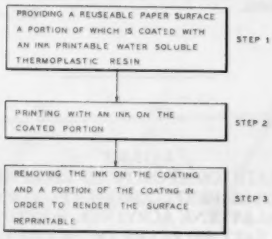
Wade A. Bullard, P.O. Box H, Sturgis, Mich. 49091

Filed Feb. 28, 1977, Ser. No. 772,477
Int. Cl.² B32B *35/00*
U.S. Cl. 427—140 **9 Claims**

1. A method for reprinting on reusable paper which is precut to precise dimensions which comprises:

(a) providing a reusable paper surface a portion of which is coated with an ink printable water soluble thermoplastic reaction product of alkylene oxides containing 1 to 6 carbon atoms with cellulose which is dried sufficiently to be tack free such that the coated portion of the paper surface becomes non-porous;

(b) printing with an ink on the coated portion without penetration of the ink to fibers forming the paper such that the ink is completely removable by rubbing with an abrasive containing rubber eraser; and


PROVIDING A REUSEABLE PAPER SURFACE A PORTION OF WHICH IS COATED WITH AN INK PRINTABLE WATER SOLUBLE THERMOPLASTIC RESIN
STEP 1
PRINTING WITH AN INK ON THE COATED PORTION
STEP 2
REMOVING THE INK ON THE COATING AND A PORTION OF THE COATING IN ORDER TO RENDER THE SURFACE REPRINTABLE
STEP 3

(c) removing the ink on the coating and a portion of the coating in order to render the surface recoatable with the thermoplastic resin and then reprintable.

4,115,603
PROCESS FOR PRODUCING LITHOGRAPHIC PRINTING PLATES HAVING A PAPER BASE

Michael J. Shaw, Kalamazoo, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

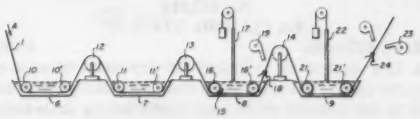
Continuation-in-part of Ser. No. 653,469, Jan. 29, 1976, abandoned. This application Aug. 11, 1977, Ser. No. 823,844
Int. Cl.² B41C *1/10*
U.S. Cl. 427—326 **6 Claims**

1. In a process for the manufacture of a lithographic printing plate having a paper base and a lithographic printing surface thereon comprising a resinous coating, said process being carried out on a fourdrinier paper machine and including the steps of forming said base and subjecting the base to initial drying, the improvemet for reducing coat weight and achieving increased fourdrinier machine speeds of at least about 350 feet per minute which comprises smoothing said base to not substantially greater than about 150 Sheffield units following said initial drying; and size-press coating onto the resulting smoothed base either a barrier coat for said lithographic printing surface or a single coat comprising said lithographic printing surface, at the rate of about 2 to about 7 pounds per ream.

4,115,604
ALUMINUM PLATING PROCESS

Max Jérémie Bernstein, Paris, France, assignor to Bremat S.A., Luxembourg, Luxembourg

Filed Apr. 6, 1976, Ser. No. 674,071
Claims priority, application Luxembourg, Apr. 7, 1975, 72235
Int. Cl.² C23C *1/02*
U.S. Cl. 427—329 **12 Claims**



1. A process for the plating of an aluminum substrate comprising the steps of:

cleaning the substrate;

coating the cleansed substrate with a layer of an intermediate alloy comprising, by weight, 80 to 86% zinc, 6 to 13% bismuth, 2 to 8% cadmium, 1 to 5% tin and 0.1 to 1.5%

lead by passing the substrate through a molten bath of the intermediate alloy; and

plating an oxidation resistant metal having a fusion point which does not exceed that of tin and its alloys over the intermediate alloy layer by passing the coated substrate through a bath containing the oxidation resistant metal in molten form.

4,115,605

ANTI-STATIC COMPOSITIONS COMPRISING A COPOLYMER OR PERFLUOROALKYL ACRYLATE AND POLYOXYALKYLENE ACRYLATE, WETTING AGENT, AND A SALT SELECTED FROM THE GROUP CONSISTING OF POTASSIUM ACETATE AND LITHIUM CHLORIDE IN AQUEOUS MEDIUM

David P. Hultman, Neenah, and Jack L. Bergsbaken, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 601,725, Aug. 4, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,559

Int. Cl.² B05D *1/28, 3/02, 3/04*

U.S. Cl. 427—377 **9 Claims**

6. A composition useful for imparting antistatic characteristics to a hydrophobic substrate while maintaining water repellency comprising, in an aqueous medium:

an essentially linear copolymer of perfluoroalkyl acrylate and polyoxyalkylene acrylate;

a salt selected from the group consisting of potassium acetate and lithium chloride, in an amount enabling said composition to impart a high level of anti-static characteristics to said substrate; and

a small amount of a nonionic, permanent wetting agent.

9. A method of treating a hydrophobic substrate whereby, in addition to imparting antistatic characteristics and maintaining water repellency, alcohol repellency is imparted to the substrate, which comprises application of the composition of claim 6 to substantially saturate the substrate, then drying and curing the substrate by exposing it to heat.

4,115,606

METHOD FOR RETARDING SCALE FORMATION

Orwin G. Maxson, and Gary D. Achenbach, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 695,276, Jun. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 550,306, Feb. 18, 1975, abandoned, which is a continuation of Ser. No. 366,929, Jun. 4, 1973, abandoned. This application Aug. 26, 1977, Ser. No. 827,916

Int. Cl.² B05D *7/14, 3/10*

U.S. Cl. 427—386 **4 Claims**

1. In a method for retarding the deposition of scale on a metallic surface wherein said surface is coated prior to exposure to an aqueous or oil base liquid having scale-forming components, the improvement wherein said metallic surface is coated with a fluid mixture of from 98 to 75 percent by weight of a low surface energy polymer selected from the group consisting of epoxy resins and polyimide resins with from 2 to 25 percent by weight of boron nitride filler, and said fluid mixture is allowed to solidify on said metallic surface prior to exposure to said liquid having scale-forming components.

4,115,607

PROCESS OF COATING ALUMINUM MATERIALS MOLDED BY EXTRUSION WITH POLYSILOXANE COATING

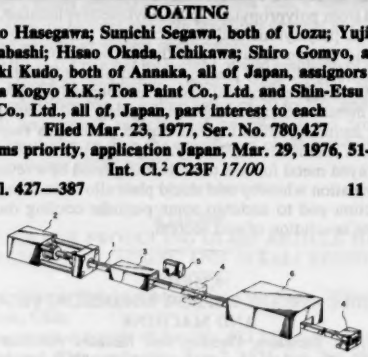
Mutsuo Hasegawa; Sunichi Segawa, both of Uozu; Yuji Koise, Funabashi; Hisao Okada, Ichikawa; Shiro Gomyo, and Yoshiaki Kudo, both of Annaka, all of Japan, assignors to Yoshida Kogyo K.K.; Toa Paint Co., Ltd. and Shin-Etsu Chemical Co., Ltd., all of, Japan, part interest to each

Filed Mar. 23, 1977, Ser. No. 780,427

Claims priority, application Japan, Mar. 29, 1976, 51-34935

Int. Cl.² C23F *17/00*

U.S. Cl. 427—387 **11 Claims**



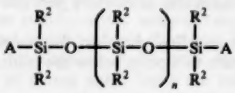
1. A process for providing protective coatings on the surface of a material composed of aluminum or an aluminum-based alloy molded by extrusion which comprises extruding said material; coating said material while its surface temperature is maintained between 550° and 250° C. following extrusion with an organopolysiloxane composition comprising

(a) from 100 to 15 parts by weight of an organopolysiloxane expressed by the average unit formula

$$R^1_a SiO_{\frac{4-a}{2}}$$

where R^1 is the same or different monovalent hydrocarbon group and a is a positive number in the range from 1.10 to 1.90 inclusive, and

(b) from 0 to 85 parts by weight of a diorganopolysiloxane represented by the general formula



where R^2 is the same or different monovalent hydrocarbon group, A is a group selected from the class consisting of monovalent hydrocarbon groups, alkoxy groups and a hydroxy group and n is a positive integer, and having a viscosity of from 100 to 1,000,000 centistokes at 25° C.

4,115,608

ORNAMENTAL SUNBURST HUB

Carl R. Glass, 1036 Partin Dr., Kissimmee, Fla. 32741

Filed Nov. 22, 1977, Ser. No. 853,915

Int. Cl.² B32B *3/02;* **403** *174;178;218*

U.S. Cl. 428—65 **1 Claim**

1. An ornamental sunburst hub for forming a plurality of

substantially rectangular, elongated spoke elements, with distal and proximal ends, and with molded spear points on their distal ends, into an ornamental sunburst, the hub comprising:

an annular inner base plate having a central opening and a peripheral edge, the base plate having a series of radially arranged, spaced apart, countersunk aperatures formed therein and being of selected depth;

an outer hub member comprising a central tubular rim and an outer wall;

said rim having an outside wall, and an inner rim wall;

the outer hub member having opposite exposed and interior surfaces and having a peripheral wall;

said exposed surface of said outer hub member having a series of decorative projections thereon;

the interior surface of the outer hub member having a plurality of radially arranged, spaced part wedge members with enlarged, rounded outer ends coincident with the peripheral wall, and having inner, pointed ends abutting and affixed integrally to the outside wall of the rim;

said wedge members defining spaces therebetween to frictionally engage the proximal ends of the spoke elements;

the wedge members having top walls spaced inwardly from the top rim wall a distance substantially equal to the depth of the base plate;

the wedge members having openings therein, and the base plate being engaged over the rim and against the wedge members with the aperatures thereof aligned with the wedge member openings; and

changeable fasteners extended through said aperatures and into said openings to clampingly engage the base plate in place.

4,115,609

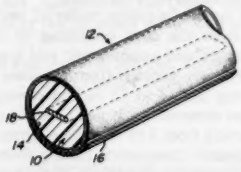
STRIP TYPE COUPLING MEMBER

Stephen A. Denman, 1216 Cloverfield Ave., Apt. (A), Dayton, Ohio 45429

Continuation of Ser. No. 183,448, Sep. 24, 1971, abandoned. This application Jan. 26, 1977, Ser. No. 762,383

Int. Cl.² B32B *1/04*

U.S. Cl. 428—68 **20 Claims**



1. A coupling device comprising a core formed of resilient material the composition of which is such to condition said core to plastically deform in response to and to the extent of an applied load when said core is at a temperature in a range from about 250° to 500° F., the composition of said core being characterized by stability when the temperature thereof is within said range, means defining a sheath for at least a portion of said core, adhesive bonding material on the exterior surface portion of said sheath, and said sheath being constructed and applied in a form to provide a directed and controlled shift of a portion of said core when the core is subjected to a load on placement of said coupling device between surfaces of parts to be bonded and caused to reach a temperature in said predetermined range, whereby to produce a controlled change in the core configuration and a bond and seal between said parts.

4,115,610

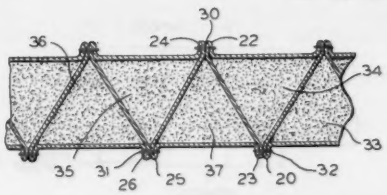
QUILT CONSTRUCTION AND METHOD OF MAKING SAME

Harold Wortman, 5936 Monroe St., Morton Grove, Ill. 60053

Filed Aug. 30, 1976, Ser. No. 719,072

Int. Cl.² B32B *3/06, 3/20*

U.S. Cl. 428—102 **12 Claims**



5. An improved quilt construction for quilted articles such as sleeping bags, jackets and bedspreads comprising:

one or more layers of quilt encompassing material means forming a top and a bottom lining surface of said quilted article;

a plurality of baffling ridges interposed between said top and bottom surfaces of quilt encompassing material means;

said baffling ridges emanating at an angle from said bottom surface to said top surface and successively from said top surface to said bottom surface and intersecting with said top and bottom surfaces respectively at a plurality of intersections, to form a series of quilt compartments,

said baffling ridges securely restrained between said top and bottom surfaces at each said intersection respectively by baffle fastening means;

said intersections in said top surface pinched and securely restrained on the upper side of said top surface; and

quilt filler means inserted into said quilt compartments.

4,115,611

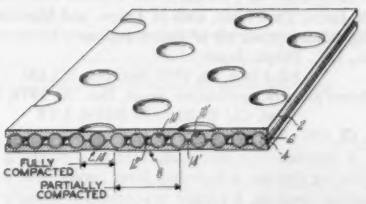
SELECTIVELY BONDED COMPOSITE TAPE

Leon Stoltze, East Hartland, and John M. Graff, West Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 749,134

Int. Cl.² B32B *3/00*

U.S. Cl. 428—174 **7 Claims**



1. A composite tape consisting of:

a layer of collimated fibers; and

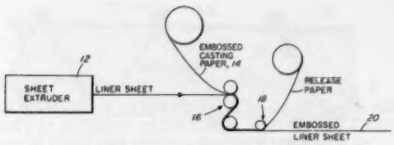
a foil sheet on each side of the fibers and in direct contact therewith, the assemblage being compacted fully only in certain non-contiguous areas to cause deformation of the sheets around the fibers and contact between and bonding of the opposed sheets between adjacent fibers in these selected areas only with this bonding holding the tape together in assembled form, the remainder of the assemblage having less compaction with the contiguous surfaces of the sheets out of contact in these areas.

4,115,612

LAMINATED THERMOPLASTIC COUNTER STIFFENER

Addison W. Closson, Jr., 41 Concord Ave., Cambridge, Mass. 02138

Filed May 4, 1976, Ser. No. 682,993
The portion of the term of this patent subsequent to Jul. 1, 1992, has been disclaimed.
Int. Cl.[2] B32B *3/30, 27/08, 31/30;* A43D *21/00*
U.S. Cl. 428—172 9 Claims



1. A method of forming a laminate which comprises:
(a) forming a thermoplastic base sheet from polyethylene or a copolymer of ethylene having a melt index of between about 0.3 to 10;
(b) forming a cross-linkable liner sheet from a low density polyethylene and a vinyl silane, the sheet having an inner surface and an outer surface;
(c) adding an ethylenically compatible coloring to the liner sheet;
(d) embossing the liner sheet on the outer surface;
(e) contacting the inner surface of the liner sheet and the base sheet;
(f) laminating the liner sheet to the base sheet;
(g) cross-linking subsequent to said lamination the vinyl silane with the polyethylene, the coloring added in step (c) remaining colorfast; and,
(h) thermoforming the laminated sheet into a desired shape.

8. A laminate which comprises:
a base sheet comprising a polyethylene or a copolymer of ethylene;
a liner sheet laminated thereto, having a cross-linked silane to polyethylene or copolymer of ethylene, its outer surface being embossed and further including an entylenically compatible color incorporated therein which will remain colorfast during and subsequent to the cross-linking of the silane.

4,115,613

HEAT-SENSITIVE RECORDING MATERIALS AND RECORDING PROCESS OF USING THE SAME

Eiichi Inoue; Taiji Nose, both of Tokyo, and Masakazu Inaba, Higashimurayama, all of Japan, assignors to Process Shizai Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,136
Claims priority, application Japan, Dec. 30, 1975, 50-158479
Int. Cl.[2] B32B *3/10;* B41M *5/18*
U.S. Cl. 428—207 23 Claims

1. A heat-sensitive recording material comprising a support and having thereon a recording layer comprising, as the heat-recording medium, a soluble heat-sensitive organic high molecular weight compound having a molecular weight between about 3,000 and 3,000,000, which is folded to show a granular state on the support, wherein said high molecular weight compound is selected from the group consisting of globular proteins and water soluble high molecular weight ethylene oxide compounds represented by the following formula (III):

$$\left(\begin{array}{l}\text{CH}-\text{CH}_2-\text{O}\\ |\\ \text{R}_6\end{array}\right)_p \qquad \text{(III)}$$

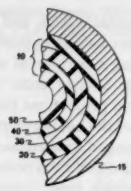
wherein R_6 represents H or CH_3 and p is a positive integer.

4,115,614

BONDING LAYERS FOR LINING ARTICLES WITH A CHLORINATED POLYETHYLENE MATERIAL

Theodore O. Martin, Jr., Wadsworth, Ohio, assignor to Chloeta F. Martin, Wadsworth, Ohio, a part interest

Filed Apr. 27, 1977, Ser. No. 791,563
Int. Cl.[2] B32B *31/00, 15/18, 17/06, 25/14*
U.S. Cl. 428—220 34 Claims



1. A duo bonding layer for adhering a chlorinated polyethylene to a rubber layer, comprising:
at least a single first bonding layer containing a blend of a material, said blend by weight having from 75 to 25 percent of a chlorinated polyethylene and from 25 to 75 percent by weight of an elastomer selected from the class consisting of natural rubber, a homopolymer, and a copolymer,
said homopolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms; said copolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 12 carbon atoms and from combinations of diene monomers having from 4 to 12 carbon atoms,
at least a single second bonding layer containing a blend of the material, said blend having from 90 to 55 percent by weight of chlorinated polyethylene and from 10 to 45 percent by weight of an elastomer selected from the class consisting of natural rubber, a homopolymer, and a copolymer,
said homopolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms; said copolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 12 carbon atoms, and from combinations of diene monomers having from 4 to 12 carbon atoms.

25. A composite layer, comprising:
at least one layer of a rubber material, said rubber material selected from the class consisting of natural rubber, a homopolymer, and a copolymer; said homopolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms; said copolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 12 carbon atoms, and from combinations of diene monomers having from 4 to 12 carbon atoms;
at least one layer of a first bonding layer bonded to said rubber layer, said first bonding layer containing a blend having from 5 to 25 percent by weight of a chlorinated polyethylene and from 25 to 75 percent by weight of an elastomer selected from the class consisting of natural rubber, a homopolymer, and a copolymer; said homopolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms; said copolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 12 carbon atoms, and from combinations of diene monomers having from 4 to 12 carbon atoms;
at least one layer of a second bonding layer bonded to said first bonding layer, said second bonding layer containing a

blend having from 90 to 55 percent by weight of a chlorinated polyethylene and from 10 to 45 percent by weight of an elastomer selected from the class consisting of natural rubber, a homopolymer, and a copolymer; said homopolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms; said copolymer made from monomers selected from the class consisting of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 12 carbon atoms, and from combinations of diene monomers having from 4 to 12 carbon atoms; and

at least one chlorinated polyethylene layer bonded to said second bonding layer so that said chlorinated polyethylene layer is bonded to said rubber layer through said bonding layers.

4,115,615
FABRIC PERMEABLE TO ULTRAVIOLET RADIATIONS

Jean-Pierre de Buck van Overstraeten, Zwijnaarde, Belgium, assignor to Uvetex Glarus AG., Glarus, Switzerland

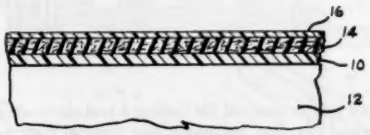
Filed May 4, 1977, Ser. No. 793,550
Claims priority, application Belgium, May 10, 1976, 166902
Int. Cl.² A41D *7/00*; D03D *15/00*
U.S. Cl. 428—229 **11 Claims**

1. A fabric, which is made from yarn of a polymer or a polymer mixture having an absorption curve of radiating energy characterized by a minimum absorption between 3,200 and 4,000 A and an important filtering below 3,200 A, said polymer being extruded at a speed allowing an extremely quick cooling such that the formation of large crystallites is inhibited while proliferation of crystallites of very small sizes is promoted, said yarn being furthermore composed of a very low number of strands, and said fabric being woven or knitted so as to minimize air/polymer interfaces.

4,115,616
SELF-SEALING FUEL LINE ASSEMBLY

Roger M. Heitz, Palos Verdes Estates, and Franklin Hill, Van Nuys, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 9, 1978, Ser. No. 876,445
Int. Cl.² B32B *3/26*
U.S. Cl. 428—310 **3 Claims**



1. A multi-laminated composite material for use in aircraft self-sealing fuel line systems comprising:

(a) a first layer of ballistic nylon impregnated with a cured epoxy resin mixture;

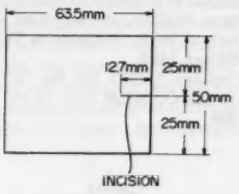
(b) a second layer of ballistic nylon impregnated with a polysulfide resin sealant; and

(c) a third layer interdisposed between and bonded to said first and second layers and composed of a precompressed, natural rubber, fuel sensitive foam.

4,115,617
WEATHER-RESISTANT ADHESIVE FILM

Yukio Mitsuishi; Shigeru Shiozaki, both of Machida, and Kinji Hasegawa, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 24, 1976, Ser. No. 669,972
Int. Cl.² B32B *15/08, 27/36*
U.S. Cl. 428—336 **8 Claims**



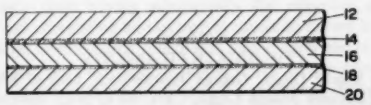
1. An adhesive film having weatherability comprising (I) a polyethylene terephthalate film base being oriented in at least one direction and having a refractive index, in the orientation direction, of 1.59 to 1.75, a refractive index, in the thickness direction, of 1.485 to 1.56, a density of 1.350 to 1,382g/cm³ and a thickness of 5 to 250 microns, (III) a layer of a metallic film applied directly to at least one surface of the film base and (II) an adhesive layer coated directly on the exposed surface of at least one of the metallic film layers.

7. An adhesive film having weatherability comprising (I) a polyethylene terephthalate film base being oriented in at least one direction and having a refractive index, in the orientation direction, of 1.59 to 1.75, a refractive index, in the thickness direction, of 1.485 to 1.56, a density of 1.350 to 1.382 g/cm³ and a thickness of 5 to 250 microns, (II) an adhesive layer coated directly on one surface of said film base, and (III) a metallic film layer applied directly to the other surface of the film base.

4,115,618
NOVEL PROTECTIVE PLASTOMERIC SHEET FOR IDENTIFICATION CARD

William T. MacLeish, North Andover, and Joseph Shulman, Hyde Park, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,220
Int. Cl.² B32B *7/06*
U.S. Cl. 428—204 **20 Claims**



1. A protective plastic sheet material comprising a cellulose ester sheet having one surface thereof hydrolyzed and a layer, bonded to said hydrolyzed surface, consisting essentially of a mixture of a hydrolyzed polyvinyl alcohol and a low molecular weight polyvinyl acetate, the ratio of the hydrolyzed polyvinyl alcohol to the polyvinyl acetate being between about 1:3 to about 3:1.

9. A laminated article which comprises a plastomeric sheet material comprising a cellulose ester sheet having one surface thereof hydrolyzed and a layer, bonded to said hydrolyzed surface, said layer consisting essentially of a mixture of a hydrolyzed polyvinyl alcohol and a low molecular weight polyvinyl acetate having a molecular weight below about 200,000 and where the ratio of the hydrolyzed polyvinyl alcohol to the polyvinyl acetate is between about 1:3 to about 3:1 and a diffusion transfer color image bonded to said layer, said color image

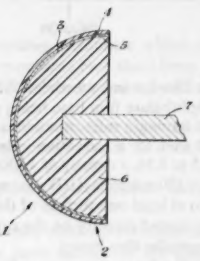
being carried in an image-receiving layer comprising a mixture of polyvinyl alcohol and poly-4-vinyl pyridine.

4,115,619

HIGHLY REFLECTIVE MULTILAYER METAL/POLYMER COMPOSITES

Virgil B. Kurfman, Midland, and Raymond E. Gransden, Jr., Beaverton, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1977, Ser. No. 757,706
Int. Cl.[2] B32B *5/00, 15/08*
U.S. Cl. 428—336 **16 Claims**



1. A formed metal/organic polymer composite comprising a normally solid thermoplastic polymer layer and a normally solid, soft metal layer adhered to at least one surface of the polymer layer, at least a portion of said formed composite having been modified during forming such that the portion undergoes a cumulative surface dimensional change of at least 20 percent, said soft metal being indium or an alloy of at least two of cadmium, indium, tin, antimony, lead, bismuth, magnesium, aluminum, zinc, copper or silver which alloy melts at a temperature or over a range of temperatures that is from about 80 to about 135 percent of the temperature used in forming, said temperatures being in ° K, said formed composite having a specular brightness essentially the same as that of the composite prior to forming.

4,115,620

CONJUGATE FILAMENTS

Rakesh Kumar Gupta; George Jurkiewitsch, both of Raleigh, and Lawrence Joseph Logan, Cary, all of N.C., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 19, 1977, Ser. No. 760,495
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—374 **12 Claims**

1. A conjugate filament capable of spontaneous crimping comprised of at least two components, one of said components being a blend of stereoregular polypropylene and from 5 to about 50% of at least one hard, non-crystalline resin compatible with said polypropylene and having a drop softening point of at least 70° C. and another of said components being stereoregular polypropylene or a blend of said polypropylene and up to 50% of at least one of said resins, said resins being selected from the group consisting of low molecular weight resins derived from hydrocarbons having at least 4 carbon atoms and rosin derivatives, and, if present in two or more of said components, the amount thereof in the respective blends differing from each other by at least 5%.

4,115,621

TEXTURING FINISH FOR SYNTHETIC FILAMENTS

Roland L. Hawkins, 2220 Hickory Dr., Spartanburg, S.C. 29302

Division of Ser. No. 542,683, Jan. 20, 1975, Pat. No. 4,069,160.
This application Nov. 11, 1977, Ser. No. 850,540
Int. Cl.[2] B05D *3/02*; B32B *27/03*
U.S. Cl. 428—395 **4 Claims**

1. A polyethylene terephthalate filament yarn having as a finish thereon a composition comprising 40 to 75 weight percent of a high molecular weight fatty acid ester lubricant characterized by a weight loss of not more than 25 weight percent when subjected to a temperature of 210° C. for 24 hours; 20 to 50 weight percent of an emulsifier for said lubricant, said emulsifier having a low fuming propensity and being stable against thermal degradation; 2 to 20 weight percent of a neutralized phosphated adduct of an alcohol having a chain length of about 8 to 18 carbon atoms and 4 to 10 moles of ethylene oxide.

4,115,622

ABRASION RESISTANT COATING COMPOSITIONS

George E. Cartier, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 7, 1977, Ser. No. 840,204
Int. Cl.[2] C09D *3/78*; C08K *5/05*; B32B *7/02, 17/10*
U.S. Cl. 428—409 **20 Claims**

1. A coating composition suitable for application to a substrate which coating composition comprises a polyvinyl acetal resin, a fluorinated aliphatic alcohol containing from 4 to 10 carbon atoms and polysilicic acid, in which the ratio by weight of polysilicic acid, calculated as SiO_2, to resin is from 1:1 to 5:1 and in which the ratio by weight of resin to alcohol is from 1:2 to 15:1.

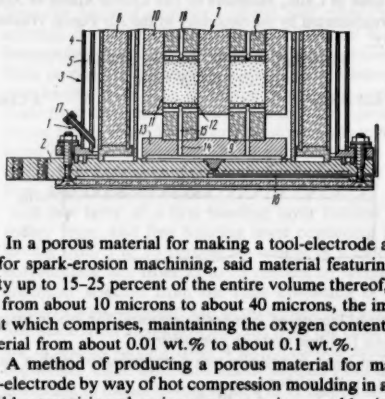
12. A substrate coated with a coating composition according to claim 1.

4,115,623

POROUS MATERIAL FOR MAKING TOOL-ELECTRODE AND METHOD OF PRODUCING SAME

Oleg Vadimovich Padalko, Nizhny Kislovsky pereulok, 8, kv. 7; Maxim Lvovich Levit, prospekt Vernadskogo 91, korpus 1, kv. 25, and Nikolai Vasilievich Voinov, Krasnodarskaya ulitsa, 8, kv. 6, all of Moscow, U.S.S.R.

Filed Aug. 25, 1976, Ser. No. 717,519
Claims priority, application U.S.S.R., Dec. 8, 1975, 2192874
Int. Cl.[2] B22F *3/00*
U.S. Cl. 428—566 **6 Claims**



1. In a porous material for making a tool-electrode applicable for spark-erosion machining, said material featuring a porosity up to 15–25 percent of the entire volume thereof, a pore size from about 10 microns to about 40 microns, the improvement which comprises, maintaining the oxygen content of said material from about 0.01 wt.% to about 0.1 wt.%.

3. A method of producing a porous material for making a tool-electrode by way of hot compression moulding in a closed mould, comprising charging a compression mould with a porous powder having a pore size from about 10 to about 40 microns, heating to a temperature in degrees centigrade equal to 0.3–0.5 of the melting temperature of the electrode material, concurrently feeding a reducing gas through the powder at a

pressure of 1.2–1.8 atm, maintaining the powder at said temperature in degrees centigrade equal to 0.3–0.5 of the melting temperature of the electrode material for a holding time long enough for the oxides contained in the powder to completely reduce, while continuing to feed the reducing gas, wherein the amount of the reducing gas is at least twice the stoichiometric quantity, said powder holding time followed by heating the powder to a temperature equal to 0.6–0.9 of the melting temperature in degrees centigrade of the elecrode material and applying a pressure necessary for shaping the material to a preset porosity.

4,115,624
THERMOSTAT METAL COMPOSITIONS

Anthony J. Izbicki, Reading, Pa., assignor to Hood & Co., Inc., Hamburg, Pa.

Filed Mar. 29, 1977, Ser. No. 782,587
Int. Cl.² B32B *15/18, 15/20*
U.S. Cl. 428—617 **7 Claims**

1. A thermostat metal in which the transverse conductivity is above about 200 BTU in/ft²hr°F comprising:
a first layer of a high expensive metal;
a second layer of a low expansive metal;
the metals of the first and second layers cooperating to provide substantially uniform flexivity over an extended temperature range; and
an intermediate layer of substantially pure copper comprising over 60% by volume of the thermostat metal, having a thermal conductivity in excess of 2,400 BTU in/ft²hr°F.

4,115,625
SODIUM THALLIUM TYPE CRYSTAL ON CRYSTALLINE LAYER

Norman E. Reitz, Redwood City, Calif., assignor to Sotec Corporation, Redwood City, Calif.

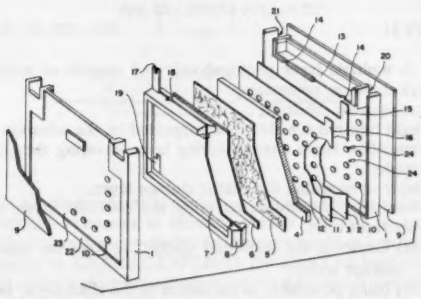
Division of Ser. No. 737,389, Nov. 1, 1976, Pat. No. 4,042,447. This application Apr. 21, 1977, Ser. No. 789,566
Int. Cl.² B32B *15/00, 15/20*
U.S. Cl. 428—641 **10 Claims**

1. A composition of matter comprising a conductive sodium thallium type crystalline alloy substrate having crystalline silicon integrally overgrown thereon in an oriented crystal layer, said substrate being selected from the group consisting of LiZn, LiAl, LiGa, LiIn, NaTl and LiCd.

4,115,626
AIR/ZINC FLAT CELL

Hans Sauer, Idstein-Walsdorf, and Dieter Spahrbier, Fischbach, Taunus, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 23, 1977, Ser. No. 780,435
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615921
Int. Cl.² H01M *8/22*
U.S. Cl. 429—27 **9 Claims**

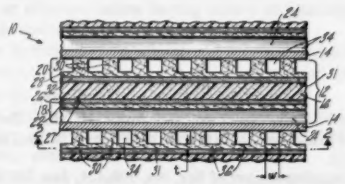


1. An air/zinc element having a plate-shaped negative zinc electrode positioned between two positive air electrodes positioned in a synthetic plastic housing and comprising
two half shells having rims and perforated outer walls, each half shell having a portion of its rim protruding outwardly beyond its perforated wall so as to space the perforations from adjoining objects,
a conductive foil, take-off conductor, and positive electrode pressed body being positioned in each half shell, and
the half shells being joined to each other, forming a synthetic plastic housing with interposition of separators and of the negative plate-shaped zinc electrode which has a synthetic plastic frame around its rim, said frame having shoulders to accomodate said separators providing an electrolyte space between said separators and said zinc electrode,
the half shells being provided with electrolyte supply apertures and take-off conductor lead-throughs.

4,115,627
ELECTROCHEMICAL CELL COMPRISING A RIBBED ELECTRODE SUBSTRATE

Larry G. Christner, Glastonbury, Conn., and Dennis C. Nagle, Catonsville, Md., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 15, 1977, Ser. No. 824,764
Int. Cl.² H01M *4/96*
U.S. Cl. 429—44 **1 Claim**

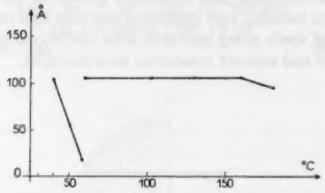


1. An electrochemical cell stack comprising a plurality of cells, adjacent cells being separated by a gas impermeable separator plate having substantially flat opposing surfaces, each cell comprising an electrolyte retaining matrix layer and a catalyst layer on each side of said matrix layer and in contact therewith, each cell also including a pair of gas porous substrates, a substrate being adjacent the nonmatrix facing side of each of said catalyst layers, said substrates comprising 50–80% carbon fibers and 20–50% carbonized resin, each substrate including a first side having hydrophilic ribs defining grooves therebetween extending across said substrate and a second side opposed to said first side and having a substantially flat surface, each of said grooves having a base, said flat surface of each of said substrates being in contact with its respective adjacent catalyst layer, said ribs of each of said substrates being in continuous contact with the flat surface of the separator plate adjacent thereto, the majority of the volume of said substrates being hydrophilic, said substrates being at least 75% porous and including a plurality of paths of hydrophilic material aligned with each rib, said paths of hydrophilic material extending from said flat surface of said substrate to said aligned hydrophilic ribs, said substrate being hydrophobic from said flat surface to the base of said grooves except for said plurality of paths of hydrophilic material aligned with each rib.

4,115,628
ELECTRODE COMPRISING A NICKEL BASED CATALYST FOR ELECTROCHEMICAL GENERATORS

Maurice Bonnemay, Boulogne-Billancourt; Guy Bronoël, Versailles; Lysiane Angely, and Gilbert Pesleibe, both of Meudon la Foret, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jan. 9, 1976, Ser. No. 647,987
Claims priority, application France, Jan. 10, 1975, 75 00722
Int. Cl.[2] H01M *4/86*
U.S. Cl. 429—44 23 Claims

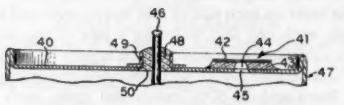


1. An electrode for an electrochemical generator enabling electrochemical oxidation of hydrogen in contact with it, comprising an electrically-conducting support and a nickel-containing catalyst deposited thereon or incorporated therewith, said nickel-containing catalyst being formed of crystallites having sizes ranging from about 20 to about 130 A and being at most reversibly oxidizable under the action of an anodic overvoltage of −300 mV and taking up spontaneously a potential sufficiently close to that of a reversible ideal hydrogen electrode with respect to an electrolyte solution saturated with molecular hydrogen to be capable of electrochemically breaking and oxidizing molecular hydrogen into hydrogen ions, H^+.

4,115,629
HERMETIC VENT STRUCTURE

Arabinda N. Dey, Needham, and James H. Him, Burlington, both of Mass., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 700,421, Jun. 28, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,149
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—56 14 Claims

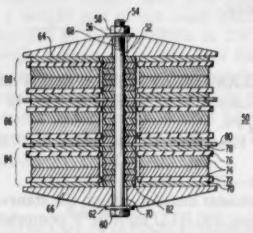


1. An electrical device in a closed metallic container having a low pressure vent therein, said vent comprising an aperture in a flexible metallic part of said metallic container said aperture having a predetermined area, a metallic member covering said aperture externally, said member being of a size greater than the size of said aperture and overlapping the periphery of said aperture, said member and said metallic part being separated by and hermetically attached to each other by a layer of glass bonded thereto, wherein movement of said member in relation to said metallic part is unimpeded by further attachment of said member to said container or to said electrical device, said glass and the metals of said flexible part and said member all having substantially equal coefficients of expansion.

4,115,630
METAL-HYDROGEN BATTERY

Gerrit Van Ommering, Chevy Chase; Joseph F. Stockel, Rockville, and James D. Dunlop, Gaithersburg, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Mar. 17, 1977, Ser. No. 778,821
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—72 22 Claims

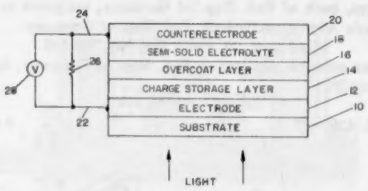


1. In a rechargeable metal oxide-hydrogen battery with a number of modules, each module having an electrode stack with a pair of positive electrodes positioned directly adjacent each other, electrode separators disposed on open faces of the respective positive electrodes, a negative electrode having a hydrophobic surface and placed adjacent to each electrode separator and a module separator placed adjacent each negative electrode to separate negative electrodes of adjacent modules, the improvement comprising: the negative electrodes of one module electrically coupled to each other and to the positive electrodes of the succeeding adjacent module in the battery and the positive electrodes in said one module electrically coupled to each other and to the negative electrodes in the preceding module, wherein a series coupled high voltage battery is formed by successive couplings of adjacent modules.

4,115,631
ENERGY STORING PHOTOGALVANIC CELL HAVING DIELECTRIC OVERCOATING

Satyendra Kumar Deb, East Brunswick, N.J., assignor to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 16, 1976, Ser. No. 706,077
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 8 Claims



1. A multiple layer photogalvanic cell capable of storing electrical charge comprising:
a transparent substrate;
a light transmissive electrode supported on the substrate;
a transition metal charge storing layer covering the electrode;
a layer overcoating the charge storage layer;
a semi-solid electrolyte covering the overcoat layer, the overcoat layer
(a) insulating the semi-solid electrolyte from the charge storage layer;
(b) being permeable to the cation of the electrolyte; and
(c) being resistant to attack by said semi-solid electrolyte;
a counterelectrode covering the semi-solid electrolyte; and

leads connected to the electrode and counterelectrode for producing a voltage therebetween when the cell converts light energy impinging thereon to electrical energy, the voltage being maintained after removal of light due to charge storage by the cells.

7. A multiple layer photogalvanic cell capable of storing electrical charge comprising:

a transparent substrate;

a light transmissive electrode supported on the substrate;

a charge storing layer covering the electrode, this layer including tungsten oxide;

a layer overcoating the charge storage layer, the overcoat layer including the oxide of a preselected metal;

a semi-solid electrolyte covering the overcoat layer, the overcoat layer insulating the semi-solid electrolyte from the charge storage layer and being permeable to the cation of the electrolyte, the electrolyte including an acidic medium mixed with a material which produces an electrolyte of preselected consistency;

a counterelectrode covering the semi-solid electrolyte; and

leads connected to the electrode and counterelectrode for producing a voltage therebetween when the cell converts light energy impinging thereon to electrical energy, the voltage being maintained after removal of light due to charge storage by the cell.

4,115,632
METHOD OF PREPARING ELECTROLYTE FOR USE IN FUEL CELLS

Kimio Kinoshita, and John P. Ackerman, both of Downers Grove, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,295
Int. Cl.[2] H01M *8/00, 8/14*
U.S. Cl. 429—188 **11 Claims**

1. A method of preparing an electrolyte for use in a fuel cell, said electrolyte including alkali metal compounds and a support material of rod-shaped, lithium-aluminate particles, the method comprising:

contacting alumina particles with a solution including a mixture of hydroxides of lithium and cations of a second alkali metal;

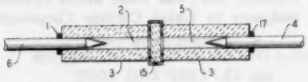
evaporating the solvent from said solution to form alumina particles impregnated and coated with said mixture of alkali metal compounds; and

maintaining said alumina particles at a temperature of 100°–450° C. to react lithium hydroxide with alumina to form rod-shaped lithium aluminate particles.

4,115,633
ELECTROCHEMICAL DEVICE COMPRISING TERNARY IONIC CONDUCTORS

Horst Manfred Kasper, Warren; Benjamin Tell, Matawan, and Sigurd Wagner, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 1, 1977, Ser. No. 783,649
Int. Cl.[2] H01M *6/18, 4/02*
U.S. Cl. 429—191 **11 Claims**



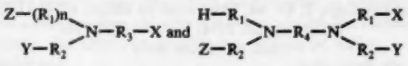
1. An electrochemical device comprising cathode and anode electrode structures in intimate contact with an electrolyte such that said anode electrode structure supplies ions to said electrolyte CHARACTERIZED IN THAT at least one of said cathode electrode structure, anode electrode structure and electrolyte being solid and includes an ionic conducting material represented by the formula AB_xC_y where A is a metallic atom with atomic number no greater than 55 which has a +1 oxidation state, B is a group III A metallic atom, C is a group VI A atom and where x and y are such that AB_xC_y is essentially electrically neutral; wherein any of said ionic conducting materials included in said electrode structures, has an ionic transport number between 0.1 and 0.9 and any of said ionic conducting materials included in said electrolyte, has an ionic transport number of at least 0.5.

4,115,634
AMINE SALTS OF AMINO ACIDS AS DELAYED ACTION CATALYSTS

Ibrahim S. Bechara, Boothwyn; Rocco L. Mascioli, Media, and Philip J. Zaluska, Glen Riddle, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Dec. 1, 1976, Ser. No. 746,312
Int. Cl.[2] C08G *18/18*
U.S. Cl. 521—126 **28 Claims**

1. In a process for the production of a urethane composition by polymerizing an organic polyisocyanate, an organic compound having an active hydrogen atom, and an organometallic catalyst, the improvement which comprises using an effective proportion of a catalyst comprising an organometallic catalyst and an amine salt of an amino acid selected from the group represented by the formulas:



wherein

R_1, R_2 and R_3 independently are alkylene groups having from 1 to 15 carbon atoms, cycloalkyl groups, phenyl groups and phenyl alkyl groups with the alkyl portion having from 1 to 6 carbon atoms; and

R_4 is an alkylene radical having from 1 to 4 carbon atoms;

X is an amine salt of a carboxylic acid group;

Y is a hydrogen atom, a hydroxyl group, a carboxylic acid group, a nitrile group, or an amine salt of a carboxylic acid group;

Z is a hydrogen atom, a hydroxyl group, a carboxylic acid group, a nitrile group, or an amine salt of a carboxylic acid group; and

n is 0 or 1;

with the proviso that when X, Y, or Z is an amine salt of a carboxylic acid group, the carboxyl moiety is the linkage bonding the X, Y, or Z radical to the residue of the amine salt of formula I or II.

4,115,635
PROCESS FOR THE PRODUCTION OF POLY (ALLYL HALIDE ALLYL ALCOHOL) POLYMER

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 757,239, Jan. 6, 1977, Pat. No. 4,069,391, which is a continuation of Ser. No. 622,525, Oct. 15, 1975, Pat. No. 4,020,259. This application Dec. 7, 1977, Ser. No. 858,112
Int. Cl.[2] C08G *77/00, 77/02*; C08F *2/00, 16/08*
U.S. Cl. 526—29 **10 Claims**

1. The process for the production of poly (allyl halide allyl alcohol) polymer by the following steps:

(a) mixing about one part by weight of an alkali silicate with about 1 to 2 parts by weight of a mono-olefinic allyl type mono-halide;

(b) agitating said mixture in a closed system and keeping the temperature between 0° and 100° C. for about 1 to 12 hours at ambient pressure, thereby

(c) producing poly (allyl halide allyl alcohol) polymer.

4,115,636

MODIFIED AND STABILIZED SYNTHETIC CIS-1,4 POLYISOPRENE AND METHOD FOR PRODUCING SAME

Lev Moiseevich Kogan, prospekt Geroev, 12, kv. 130; Natalya Borisovna Monastyrskaya, Tramvainy prospekt, 18, kv. 33; Larisa Mikhailovna Davydova, ulitsa Partizana Germana, 10, korpus P, kv. 82; Elena Nikolaevna Kropacheva, Grechesky pereulok, 12, kv. 61, all of Leningrad; Izrail Markovich Belgorodsky, ulitsa K. Marxa, 50, kv. 25, Tolyatti; Olga Izrailevna Belgorodskaya, ulitsa Podvoiskogo, 24, korpus 1, kv. 313; Basia Moiseevna Bolkhovets, prospekt Geroev, 26, kv. 5, both of Leningrad; Anatoly Vasilievich Gagin, ulitsa Pobedy, 72, kv. 62, Tolyatti; Izmail Vladimirovich Garmonov, ulitsa Saltykova-Schedrina, 20, kv. 18, Leningrad; Nikolai Fedorovich Kovalev, prospekt Veteranov, 147, kv. 170, Leningrad; Vladimir Alexandrovich Krol, ulitsa Avtovskaya, 25, kv. 8, Leningrad; Anatoly Ivanovich Lukashov, ulitsa Palekhskaya, 9, korpus 1, kv. 65, Moscow; Valentin Vasilievich Sazykin, ulitsa K. Marxa, 64, kv. 8, Tolyatti; Vladislav Petrovich Smirnov, Kirovsky prospekt, 73/75, kv. 17, Leningrad; Arkady Samuilovich Estrin, prospekt K. Marxa, 33/1, kv. 35, Leningrad; Jury Alexandrovich Lvov, ulitsa Letchika Pilotova, 46, kv. 15, Leningrad; Efim Moiseevich Sire, ulitsa K. Marxa, 64, kv. 27, Tolyatti; Lidia Mikhailovna Pospelova, ulitsa Sovetskaya, 63, kv. 27, Tolyatti; Ljubov Petrovna Bataeva, ulitsa Gorkogo, 29-b, kv. 9, Tolyatti; Semen Moiseevich Kavun, ulitsa 26 Bakinskikh komissarov, 7, korpus IV, kv. 97, Moscow, and Anatoly Sergeevich Lykin, poselok Kuchino, proezd Zhukovskogo, 5, kv. 64, Moskovskaya oblast, all of U.S.S.R.

Filed Sep. 29, 1976, Ser. No. 727,716

Int. Cl.[2] C08F *8/32*

U.S. Cl. 526—47.6 7 Claims

1. A method for producing modified and stabilized synthetic cis-1,4 polyisoprene comprising polymerization of isoprene in a hydrocarbon solvent in the presence of a Ziegler-Natta catalyst, contacting the polymerization mass with 0.05 to 1 mass percent of 4-nitrosodiphenylamine, and degassing and drying the rubber thus produced at 100° to 250° C.

4,115,637

METHOD FOR CURING POLYMERS CONTAINING HYDROXYALKYLAMIDE GROUPS BY MEANS OF NONPOLYMERIC POLYCARBOXYLIC ACIDS, AND COMPOSITIONS

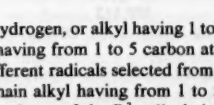
Harry J. Cenci, Warminster, and Graham Swift, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 454,645, Mar. 25, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,552

Int. Cl.[2] C08J *3/24, 5/12;* C08K *5/12*

U.S. Cl. 526—56 26 Claims

1. A method of curing addition polymers containing two or more pendant β-hydroxyalkyl amide groups of the formula:



IV

wherein R^1 is hydrogen, or alkyl having 1 to 5 carbon atoms, or hydroxyalkyl having from 1 to 5 carbon atoms; R^2 and R^3 are the same or different radicals selected from hydrogen, straight or branched chain alkyl having from 1 to 5 carbon atoms, or one of the R^2 and one of the R^3 radicals joined together with the carbon atoms to which they are attached form cycloalkyl, which comprises the steps of (1) mixing said polymer with a nonpolymeric polycarboxylic acid free of polymerizable unsaturation or a mixture of such acids, and (2) reacting the acid and polymer by heating the mixture at a temperature of from about 125° to 400° C. until the cured polymer is obtained.

4,115,638

PROCESS FOR LETTING DOWN ETHYLENE HIGH PRESSURE POLYMERIZATION SYSTEMS

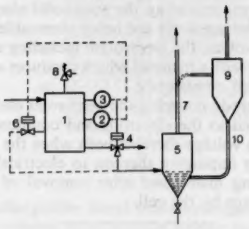
Rolf Becker, Weinheim-Hohensachsen; Klaus Borho, Frankenthal; Oskar Buechner, Dudenhofen; Hans Gropper, Ludwigshafen, and Ulrich Hartig, Neckargemuend, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,462

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631834

Int. Cl.[2] C08F *10/02*

U.S. Cl. 526—61 10 Claims



1. A process for rapidly lowering the pressure in a continuously operated high-pressure polymerization system in which ethylene or a mixture of ethylene and one or more compounds copolymerizable with ethylene is polymerized at from 500 to 5,000 bars and from 150° to 400° C., to a pressure below the prevailing reaction pressure, when predetermined pressure and/or temperature limits are exceeded or another fault occurs, by opening one or more relief devices fitted to the high pressure polymerization system and transferring the let-down hot reaction mixture from the polymerization system via one or more let-down lines through one or more expansion vessels into the atmosphere, wherein the jet of let-down hot reaction mixture issuing from the let-down line is led into a partially water-filled expansion vessel at an angle of from 0° to 45° to the water surface, so that the jet does not enter below the surface but touches or strikes it, the volume of the expansion vessel being at least as great as the volume of the high pressure polymerization system which is to be let down.

4,115,639

ETHYLENE POLYMERIZATION WITH ETHER MODIFIED CATALYST

Gary Leigh Brown, South Charleston, W. Va.; Weldon Clifford Cummings, Victoria, Tex., and Isaac Jacob Levine, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

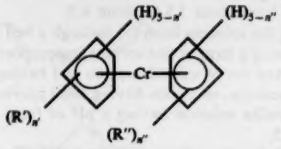
Filed Dec. 20, 1973, Ser. No. 426,559

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—130 32 Claims

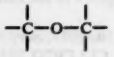
1. In a process for polymerizing a monomer charge comprising ethylene by contacting said charge with activated inorganic oxide supported bis(cyclopentadienyl) chromium [II] catalyst

wherein said inorganic oxide is selected from the group consisting of silica, alumina, thoria, zirconia and mixtures thereof, and the bis(cyclopentadienyl) chromium [II] compound has the structure



wherein n' and n'' are each integers of 0 to 5, inclusive, and R′ and R″ are each C_1 to C_{20}, inclusive, hydrocarbon radicals,

the improvement which comprises modifying said catalyst prior to said contact with said monomer charge by contacting said catalyst with, per mol of the organochromium compound, 0.01 to 20mols of at least one modifying compound having in its structure at least one moiety of the formula



said modifying compound being devoid of OH, SH, NH_2, COOH, halogen, alkoxy and aryloxy radicals in such amounts as would poison the polymerization system under the prevailing reaction conditions, and

said modifying with said modifying compound providing a modified catalyst with which, in comparison to the use of the unmodified catalyst in said polymerization process, polymers of improved impact strength are prepared.

4,115,640

AFTERTREATMENT OF SPRAY DRIED, POWDERED VINYL CHLORIDE EMULSION POLYMERIZATES

Josef Kalka, Herten, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,397

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1975, 2541008

Int. Cl.² C08F *6/02*

U.S. Cl. 528—483 **11 Claims**

1. A process for improving the rheological properties of powdered polymerizates formable into plastisols, which comprises polymerizing vinyl chloride or a mixture of vinyl chloride and a copolymerizable monomer in an aqueous emulsion in the presence of a water-soluble catalyst and an alkali metal salt of a fatty acid as the polymerization emulsifier, spray drying the resultant polymerizate to form a powder, and subsequently treating the powdered polymerizate with a gas mixture which forms an acid in an aqueous solution to effect said improvement in rheological properties wherein the acid-forming gas is present in the gas mixture at a concentration of 0.5–20% by volume.

4,115,641

RIBOFURANOSYL-IMIDAZOLE DERIVATIVES

Ulf Fischer, Frenkendorf, and Pierre-Charles Wyss, Muttenz, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

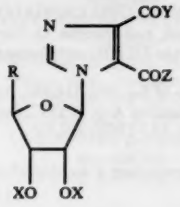
Filed Aug. 1, 1977, Ser. No. 820,501

Claims priority, application Austria, Aug. 6, 1976, 5859/76

Int. Cl.² C07H *17/00*

U.S. Cl. 536—23 **17 Claims**

1. A compound of the formula



I

wherein R,X,Y and Z have one of the meanings set forth hereinafter under (1)-(5):

(1) R is —CH_2OH;

X is H, and

Y and Z are —C_{1-4}-alkoxy, —NH(C_{1-7}-alkyl), —NH(C_{2-4}-alkenyl), —NH(C_{3-6}-cycloalkyl) or —NH-phenyl-(lower alkyl); or

(2) R is —CH_2ONO_2;

X is —NO_2; and

Y and Z are —C_{1-4}-alkoxy, —NH_2, —NH(C_{1-7}-alkyl), —NH(C_{2-4}-alkenyl), —NH-phenyl-(lower alkyl) or —N(-NO_2)(C_{1-7}-alkyl); or

(3) R is —COO(C_{1-4}-alkyl), —$CONH_2$, —CONH(C_{1-4}-alkyl), —CONH(C_{2-4}-alkenyl); —CONH(C_{3-6}-cycloalkyl) or —CO—Het wherein Het is a 5-membered or 6-membered heterocyclic ring which may contain, in addition to the nitrogen atom via which it is bound with the carbonyl group, the hetero atom nitrogen, oxygen or sulfur;

X is H; and

Y and Z are —NH_2 or —NH(C_{1-7}-alkyl); or

(4) R is —COO(C_{1-4}-alkyl);

X is —NO_2; and

one of Y and Z is —NH_2 and the other is —$NHNO_2$; or

(5) R is —$CONH_2$, —CONH(C_{1-6}-alkyl) or —CONH(C_{3-6}-cycloalkyl);

X is —NO_2; and

both of Y and Z are —NH_2, —NH(C_{1-7}-alkyl) or —N(-NO_2)(C_{1-7}-alkyl) or one of Y and Z is —NH_2 and the other is —$NHNO_2$.

4,115,642

METHOD FOR PREPARING AURANOFIN

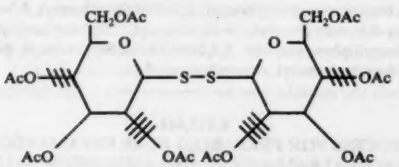
David T. Hill, North Wales, Pa.; Ivan Lantos, Blackwood, N.J., and Blaine M. Sutton, Hatboro, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jun. 30, 1977, Ser. No. 811,641

Int. Cl.² C07H *23/00*

U.S. Cl. 536—121 **5 Claims**

1. The method of preparing auranofin comprising reacting the compound of the formula:



in which Ac is acetyl, with a compound of the formula:

$(C_2H_5)_3PAuX$

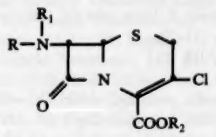
in which X is lower alkylthio of 1–6 carbons, benzylthio, phenethylthio or triethylphosphinegoldthio in an organic solvent in which said reactants are soluble and which is chemically inert toward the reactants.

4,115,643
PROCESS FOR 3-CHLORO CEPHALOSPORINS

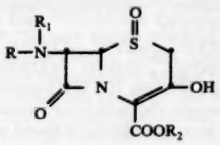
Stjepan Kukolja, Carmel, and Douglas O. Spry, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 714,948, Aug. 16, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,472
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—16 **9 Claims**

1. The process for preparing a 3-chloro-3-cephem ester of the formula

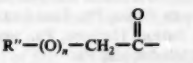


which comprises the step of reacting a 3-hydroxy-3-cephem sulfoxide ester of the formula



under substantially anhydrous conditions in the presence of dimethylformamide at a temperature between about −65° C. and about 25° C. with between about 2 and about 9 moles of a chlorinating agent selected from the group of phosphorus trichloride, phosphorus pentachloride and phosgene, per mole of said sulfoxide ester wherein R is an acyl group of the formula

wherein R′ is C_1–C_6 alkyl, phenyl, or phenyl substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, or carboxy; or R is an acyl group of the formula



wherein R″ is thienyl, furyl, phenyl, or phenyl substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, or carboxy, n is 0 or 1; and when n is 1 R″ is other than thienyl or furyl; R_1 is hydrogen or R_1 and R taken together with the nitrogen atom to which they are attached are succinimido or phthalimido; and R_2 is benzyl, 4-methoxybenzyl, 3,5-dimethoxybenzyl, 3,5-dimethoxy-4-hydroxybenzyl, 4-nitrobenzyl, diphenylmethyl, 4-methoxydiphenylmethyl, 2,2,2-trichloroethyl, t-butyl, phenacyl, 4-nitrophenacyl, or methoxymethyl.

4,115,644
PROCESS FOR PREPARING PURE CEFAMANDOLE FROM ALKALI METAL AND AMMONIUM SALTS THEREOF

Ta Sen Chou, and Gary D. Zintgraff, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 19, 1977, Ser. No. 834,633
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—20 **7 Claims**

1. A method of preparing pure crystalline cefamandole from alkali metal and ammonium salts thereof comprising:

(a) dissolving the cefamandole salt in water;

(b) acidifying the solution from (a) with a buffer solution to a pH of from about 3.5 to about 4.5;

(c) passing the solution from (b) through a bed of adsorbent resin having a large active surface (macroporosity) conducive to van der Waals adsorption and having weak electrolyte activity, said resin having been previously flushed with a buffer solution having a pH of from about 3.5 to about 4.5;

(d) crystallizing the cefamandole from the effluent from said resin bed by adjusting the pH of said effluent to about 2; and,

(e) separating the crystalline cefamandole from the acidified effluent.

4,115,645
DECOLORIZING PROCESS FOR 7-AMINO-3-(((2-METHYL-1,3,4-THIADIAZOL-5-YL)THIO)METHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Billy G. Jackson, Indianapolis, and Roger E. McPherson, Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 10, 1977, Ser. No. 795,464
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—20 **7 Claims**

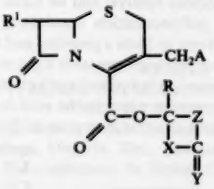
1. A process for decolorizing impurities associated with 7-amino-3-(((2-methyl-1,3,4-thiadiazol-5-yl)thio)methyl)-3-cephem-4-carboxylic acid or a salt thereof, which comprises (1) adding a reducing agent selected from the group consisting of sodium sulfite and sodium dithionite to an aqueous solution of a salt of 7-amino-3-(((2-methyl-1,3,4-thiadiazol-5-yl)thio)methyl)-3-cephem-4-carboxylic acid and colored impurities, and (2) recovering decolorized 7-amino-3-(((2-methyl-1,3,4-thiadiazol-5-yl)thio)methyl)-3-cephem-4-carboxylic acid or a salt thereof from the solution.

4,115,646
PROCESS FOR PREPARING 7-AMINOCEPHALOSPORANIC ACID DERIVATIVES

Peter Hubert Bentley, Rudgwick, and Gerald Brooks, Reigate, both of England, assignors to Beecham Group Limited, Brentford, England

Continuation of Ser. No. 652,527, Jan. 26, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,371
Claims priority, application United Kingdom, Feb. 22, 1975, 7546/75
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—27 **8 Claims**

1. A process for the preparation of a compound of formula (IA):



(IA)

wherein

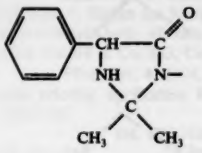
X and Y are both oxygen;

Z is 1,2-phenylene unsubstituted or substituted by alkoxy, nitro or halogen;

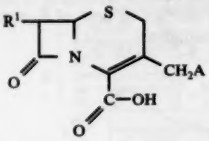
R is hydrogen, phenyl or methyl;

A is hydrogen, acetoxy, carbamoyloxy or a 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2,3,4-tetrazolyl, oxazolyl, thiazolyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl or 1,2,4-thiadazolyl group;

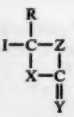
R^1 is an amino group, an organic acylamino group which is conventional for cephalosporin side chains, or a group of formula:



which process is characterized by esterifying a compound of formula:



or a salt thereof, with an iodolactone of formula:



to form the corresponding 3-cephem cephalosporin lactonyl ester substantially exclusively.

4,115,647

AMIDINOUREAS

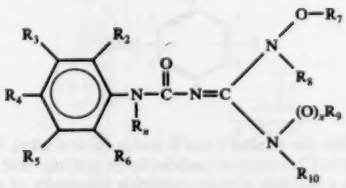
George Henry Douglas, Malvern; William Lyon Studt, Harleysville, and Stuart Alan Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557. This application Jun. 17, 1977, Ser. No. 881,092

Int. Cl.[2] C07D *261/00, 265/02*

U.S. Cl. 544—63 **7 Claims**

1. A compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are: hydrogen, halo, loweralkyl, halooweralkyl, nitro, amino, acylamino, hydroxy, aralkyloxy or loweralkoxy;

R_n is hydrogen or loweralkyl;

R_7 and R_8 together and R_9 and R_{10} together may form a ring selected from the group consisting of isooxazolidine and isooxazine;

x is 0–1;

R_9 and R_{10}, when x is 0, may be the same or different and are: hydrogen, alkyl, alkenyl, alkylyl, cycloalkyl or aralkyl;

the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than 12; and

the non-toxic acid addition salts thereof.

4,115,648

2,5-DIHYDROXY BENZENE SULFONIC ACID MONO ESTERS

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios del Dr. Esteve, S.A., Barcelona, Spain

Division of Ser. No. 505,934, Sep. 13, 1974, Pat. No. 3,954,767, which is a continuation-in-part of Ser. No. 360,394, May 14, 1973, Pat. No. 3,876,651. This application Oct. 28, 1975, Ser. No. 626,024

Int. Cl.[2] C07C *143/68;* **C07D** *295/00*

U.S. Cl. 544—110 **2 Claims**

1. Diethylamine 2,5-dihydroxy benzene sulfonate monotosylate.

2. Morpholine 2,5-dihydroxy benzene sulfonate monotosylate.

4,115,649

PHENYL PYRAZOLE MORPHOLINE AMIDES

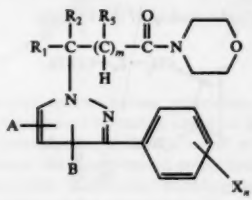
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, Pat. No. 4,072,498, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,181

Int. Cl.[2] C07D *413/06*

U.S. Cl. 544—140 **2 Claims**

1. A compound of the formula:



where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl $m = 0$; R_2 and R_3 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when $m = 0$; m is 0 or 1 provided that when $m = 0$, R_1 is not hydrogen and when $m = 1$ at least one of R_2 or R_3 is hydrogen; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and n is 0, 1, or 2 or an acid addition salt thereof.

4,115,650

PROCESS FOR PREPARING 2,4-DIAMINO-5-(SUBSTITUTED BENZYL)-PYRIMIDINES

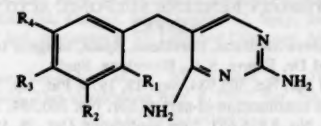
Percy Manchand, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 17, 1976, Ser. No. 742,959

Int. Cl.[2] C07D *239/48, 405/06*

U.S. Cl. 544—324 **2 Claims**

1. A process for the preparation of 2,4-diamino-pyrimidines of the formula



wherein R_1 is hydrogen or lower alkyl; R_2 is hydrogen or lower alkoxy; R_3 is lower alkoxy or lower alkyl; R_4 is hydrogen or lower alkoxy; and R_2 and R_3, when taken together, are methylenedioxy,

which comprises the steps of treating the correspondingly substituted α-alkoxymethylcinnamonitrile with an alkali metal alkoxide in 2-methoxyethanol and an alkanol of the formula ROH, wherein R is lower alkyl, and treating the resulting reaction mixture with guanidine at a temperature in the range of from about 100° to about 140° C.

4,115,651

CIS-4,5-DIDEHYDRO-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGF$_{1\alpha}$COMPOUNDS

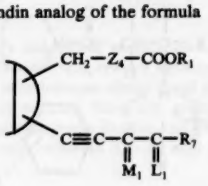
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,979

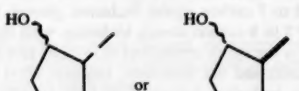
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—55 **73 Claims**

1. A prostaglandin analog of the formula



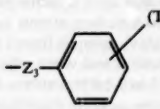
wherein D is



wherein Z_4 is cis-CH_2-CH=CH-$(CH_2)_g$-CF_2-,

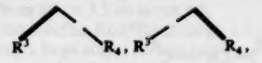
wherein *g* is one, 2, or 3;

wherein R_7 is

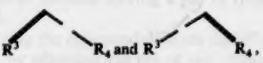


wherein Z_3 is oxa or methylene, *s* is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is

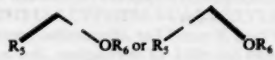


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;

wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,115,652

PROCESS FOR THE PREPARATION OF AMINO-NITROPHENOLS

Karl Linhart, and Adolf Friedrich, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

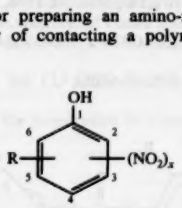
Filed Mar. 30, 1977, Ser. No. 783,036

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2624825

Int. Cl.^{2} C07C *79/28, 91/34*

U.S. Cl. 568—706 **13 Claims**

1. A process for preparing an amino-nitrophenol which consists essentially of contacting a polynitrophenol of the formula



wherein

x signifies the number 2 and R stands for low alkyl, fluorine, chlorine, bromine or carboxylic or sulfonic acid residue with a reaction mixture consisting essentially of an aqueous ammonia solution and sodium hydrogen sulfide, said aqueous ammonia being present in an amount of 1 to 8 mols ammonia per mol of polynitrophenol and said sodium hydrogen sulfide being present in an amount of 2.5 to 6 mols sulfide ion per mol of polynitrophenol and the reaction being performed at room temperature up to 100° C.

4,115,653

ELECTRON BEAM VAPORIZER

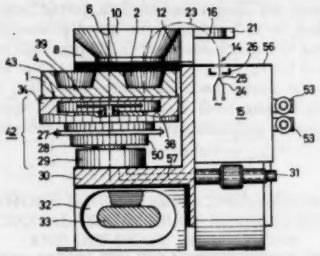
Gerhard Kienel, Hanau am Main, and Helmut Petersein, Gelnhausen-Höchst, both of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Oct. 4, 1976, Ser. No. 729,575

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544725

Int. Cl.[2] H01J *37/305*

U.S. Cl. 13—31 5 Claims



1. Electron beam varporizer comprising beam generating means with heated cathode means, focusing means and electromagnetic deflection means for the deflection and guidance of the beam, exchangeable, fluid-cooled vaporizing crucible means associated with the beam generating means and relatively movable with respect thereto and having at least one depression in the base thereof for at least one substance to be vaporized and passages for the flow of coolant beneath said depression, said vaporizing crucible means and the base thereof being constructed as separate components and having a common contact surface so that a removable crucible head is formed, said crucible base being closed off from its environment with regard to said flow passages.

4,115,654

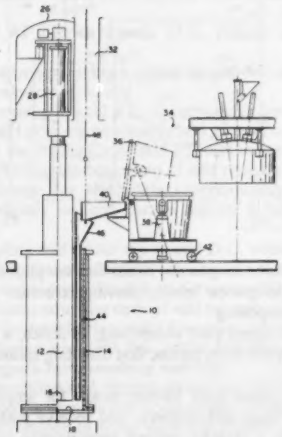
INTRODUCTION OF STARTING MOLTEN FLUX FROM THE TOP OF A CRUCIBLE

Patrick J. Wooding, Moorestown, N.J., and Clifton P. Anderson, Morrisville, Pa., assignors to Wooding Corporation, Moorestown, N.J.

Filed Mar. 1, 1977, Ser. No. 773,330

Int. Cl.[2] F27D *3/14;* H05B *3/60*

U.S. Cl. 13—33 14 Claims



1. In an electroslag melting system including a crucible having interior side walls and an opening adjacent the top thereof, a consumable electrode extending downwardly through said opening into the interior of said crucible, the outer dimensions of said electrode being slightly less than the inside dimensions of said crucible whereby a narrow annular space remains between said electrode and the inside walls of said crucible and means for introducing pre-melted flux into the bottom of said crucible, the improvement comprising: means for guiding said pre-melted flux downwardly from said opening and through said narrow space while substantially preventing said flux from contacting said side walls of said crucible and said electrode.

4,115,655

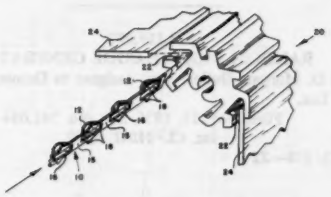
ELECTROMAGNETIC INTERFERENCE SHIELDING DEVICE

Leon Austin Prentice, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 18, 1976, Ser. No. 743,014

Int. Cl.[2] H05K *9/00*

U.S. Cl. 174—35 R 5 Claims



1. An electronic cabinet having supporting members provided with groove means extending along the lengths thereof, metal closure means having their edge means positioned within the groove means, the improvement comprising:

an electromagnetic interference shielding means which includes a substantially planar strip of metal having first contact means extending outwardly from each side of said strip and being located at spaced locations along said strip, said first contact means being located in the plane of said planar strip, the width of said strip across said first contact means being slightly wider than the groove means along which said strip is disposed so that said first contact means scores the surfaces of the groove means as said strip is moved along the groove means thereby breaking down any oxide coating on said first contact means and the surfaces of the groove means and making connection therewith, said strip extending along substantially the entire length of the groove means; and

second contact means provided by said strip extending outwardly from the plane of said planar strip engaging the edge means of the closure means that are disposed within the groove means.

4,115,656

SHIELDED PASSAGEWAY INTERCONNECTION FOR ELECTROMAGNETIC INTERFERENCE SHIELDED SHELTERS

Moe Lawrence Aitel, Andover, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 8, 1976, Ser. No. 674,810

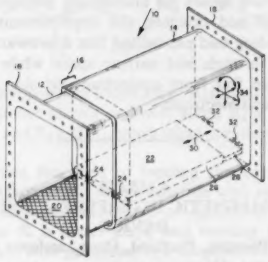
Int. Cl.[2] H05K *9/00*

U.S. Cl. 174—35 MS 26 Claims

1. An EMI shielding passageway for use between shelters having portals comprising:

loosely fitting telescoping sections, said sections having electrically conducting walls, portions of which overlap, resilient EMI shielding material between the walls of the

overlapped portions of the sections, said shielding being electrically connected to said walls, and



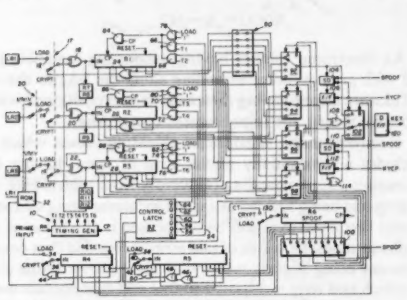
means at the end of a telescoping section opposite the overlapped portion for fixedly and electrically attaching said end to one of said shelters at the portal thereof.

4,115,657

RANDOM DIGITAL CODE GENERATOR

Barrie O. Morgan, Dallas, Tex., assignor to Datotek, Inc., Dallas, Tex.

Filed Nov. 11, 1976, Ser. No. 741,014
Int. Cl.[2] H04L *9/00*
U.S. Cl. 178—22 **32 Claims**



10. A random code generator for generating a randomized digital key stream comprising:

a plurality of first registers of different lengths and different cycle periods, the cycle period of each of said first registers not including common factors with the cycle periods of any of the remaining ones of said first registers,

a plurality of second registers,

means for individually clocking said second registers in dependence upon the digital data contained within different ones of said first registers, and

means for receiving the output from said second registers and for generating a randomized digital key stream in response thereto.

4,115,658

TWO WAY TELEPHONE AMPLIFIER

Richard W. Williams, 2837 S. Raritan, Englewood, Colo. 80110

Filed Apr. 11, 1977, Ser. No. 786,335
Int. Cl.[2] H04M *9/08*
U.S. Cl. 179—1 HF **7 Claims**

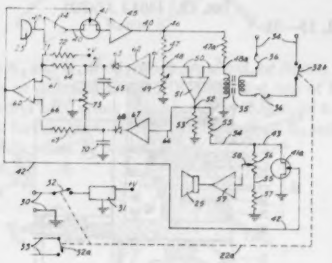
1. A telephone amplifier system comprising

(a) signal transfer means from and to a telephone line including a coupling transformer connected for both transmit and receive signals at one side of transformer secondary coil;

(b) a transmit amplifier circuit and a receive amplifier circuit connected to said one side,

(c) normally on switching means in said transmit amplifier circuit holding the same closed in absence of a received signal,

(d) bridge circuit means between said one side and said



transmit amplifier circuit and said receive amplifier circuit,

(e) a differential amplifier connected in said bridge circuit, and

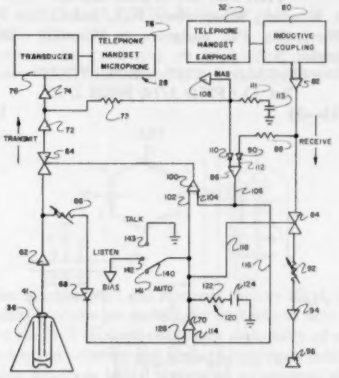
(f) a comparator circuit means for closing said receive amplifier circuit on receipt of a received signal and opening said transmit amplifier circuit.

4,115,659

ELECTROACOUSTICAL TELEPHONE ADAPTER

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540, and Leonard F. Shepard, Dover, Del., assignors to Abram N. Spanel, Princeton, N.J.

Filed Jun. 16, 1977, Ser. No. 807,104
Int. Cl.[2] H04M *9/08, 1/21*
U.S. Cl. 179—1 HF **29 Claims**



1. A telephone adapter for hands-free telephony, adapted for use with a telephone handset having structure including an earpiece, comprising:

a transmit signal path comprising, in series, a microphone, first amplification means, first disabling means and a transducer;

a receive signal path having means for amplifying sound energy from said earpiece, said receive path comprising, in series, a coupler, second amplification means, second disabling means and speaker means;

bias means for maintaining said transmit path in an active state when no signals are present; and,

means for interrupting said circuit paths in a complementary manner, comprising:

means for introducing a predetermined delay prior to disabling;

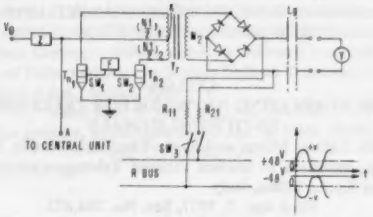
means for shortening said delay in response to a louder sound received by said microphone;

a comparator having at least two inputs, one of said comparator inputs connected to the output of said transmit path, and another of said at least comparator inputs connected to said receive path; and, third amplification means, having at least two inputs, the output of said comparator being connected to one of said inputs of said third amplification means, another of said inputs of said third amplification means connected to said transmit path, said second disabling means, and said delay means, the output of said third amplification means being connected to the first disabling means.

4,115,660
TELEPHONE LINE INTERFACING CIRCUIT WITH DIRECTIONAL TRANSFER OF RINGING CURRENT AND OFF-HOOK INDICATIONS

Alain Croisier, Cagnes-sur-Mer, and Christian Jacquart, Gattières, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,329
Claims priority, application France, Oct. 4, 1976, 76 30658
Int. Cl.[2] H04M *3/18*
U.S. Cl. 179—2.5 R **3 Claims**



1. A circuit for interfacing a telephone exchange having a source of ringing current with a line connected to a telephone set having a ringing bell facility, said facility subject to audible actuation by said ringing current, said interface circuit comprising:

sources of RF carrier signals, D.C. voltage and ground voltage;

an RF transformer having a center-tapped primary winding and a secondary winding;

means responsive to said RF carrier signals for connecting ends of said primary winding to said ground voltage alternately at the frequency of said RF carrier signals;

means connecting the center tap of said primary winding to said exchange for effectively superimposing voice frequency signals on said carrier signals in said primary winding;

means coupling said center tap to said D.C. voltage through a series impedance effective to prevent voice frequency signals from passing through said source of D.C. voltage;

detection means coupling ends of said secondary winding to said line for transferring voice frequency signals between said exchange and said line while preventing said RF carrier signals from reaching said line;

means for coupling said ringing current to said line, including a disconnection switch controllable by said exchange and an impedance in series with said switch, said impedence related to the impedance presented to said line by said telephone set in the off-hook state;

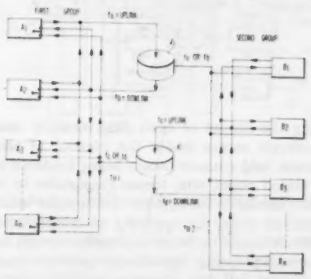
said detection means being conditioned to prevent passage of any signals between said exchange and said line when said ringing current is coupled to said set and said set is in the on-hook state;

said detection means further being responsive to the impedance change in said set accompanying the transition of said set from on-hook state to off-hook state, even when ringing current is present on said line, for passing a signal to said exchange uniquely indicative of said transition; said uniquely indicative signal being useful to actuate said exchange to control said disconnection switch to disconnect said ringing current from said line and thereby from said set.

4,115,661
SINGLE CHANNEL PER BURST TDMA MULTIPLE TRANSPONDER NETWORK

William G. Schmidt, Gaithersburg, Md., assignor to Satellite Business Systems, McLean, Va.

Filed Mar. 21, 1977, Ser. No. 779,874
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **24 Claims**



7. A time division multiple access network for communication between a plurality of geographically separated stations through at least two satellite-located transponders, comprising a first transponder associated with a first group of stations of said plurality, each of said first group of stations capable of establishing go and return communication links through said first transponder using a first common up-link frequency and a first common down-link frequency, a second transponder associated with the second group of stations of said plurality, each of said second group of stations capable of establishing go and return communication links through said second transponder using a second common up-link frequency and a second common down-link frequency, said first group of stations capable of establishing go or return communication links with stations of said second group through said second transponder, exclusive of said first transponder, and said second group of stations capable of correspondingly establishing return or go communication links with stations of said first group through said first transponder, exclusive of said second transponder.

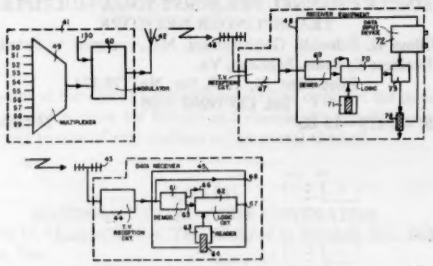
4,115,662
ONE WAY DATA TRANSMISSION SYSTEM

Yves Maurice Guinet, Rennes, and Yves Maurice Noirel, Montfort, both of France, assignors to Etablissement Public Dit Telediffusion de France, Montrouge and L'Etat Francais, Represente par le Secretaire d'Etat aux Postes et Telecommunications, Issy-les-Moulineaux, both of, France

Continuation of Ser. No. 689,493, Jun. 3, 1976, Pat. No. 4,055,830. This application Sep. 6, 1977, Ser. No. 830,683
Claims priority, application France, Jun. 6, 1975, 75 18319
Int. Cl.[2] H04M *1/32, 1/34, 1/44*
U.S. Cl. 179—15 BV **2 Claims**

1. A one-way data transmission system for use in a communication system wherein a transmitter station is connected to transmit data packs of information at a system data bit rate and over a plurality of channels, with transmission on a time multi-

plex basis, each data pack, comprising a prefix signal containing a synchronization signal, channel identification signal, and a format signal which indicates the length of the data sequence which follows the prefix within the data pack, said data transmission system comprising: a transmitter station containing a plurality of coupler means, there being one coupler for each of said channels, each coupler including an input circuit means, data memory means, and counter means, means for coupling an output of each channel to the input circuit means of its associated coupler means, means for coupling the output of each input circuit means to the input of an associated one said data memory means, multiplex circuit means, common control means associated with a plurality of said coupler means, means



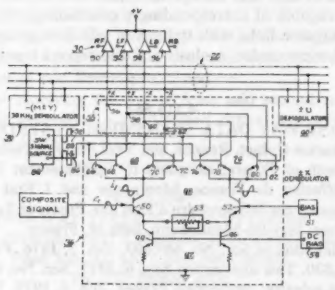
for coupling the output of each data memory means to said multiplex circuit means under the control of said common control means, said counter means being loadable with data at a predetermined count rate, means responsive to either a full data memory means or the counter in a coupler means reaching a predetermined count for applying an inhibit order signal to an input circuit means in the same coupler means, said full data memory condition being signalled responsive to information contained in said full data memory condition for connecting said data memory means to said multiplex circuit means when it next becomes idle, the data in said data memory means being then transferred to said multiplex circuit means, and means for thereafter resetting said counter and removing said inhibit order.

4,115,663

DOUBLY BALANCED DEMODULATOR FOR MULTIPLE CHANNEL FM STEREO SYSTEM

Dirk de Weger, Buffalo Grove, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 4, 1976, Ser. No. 729,510
Int. Cl.[2] H04H 5/00
U.S. Cl. 179—15 BT **2 Claims**



1. A doubly balanced demodulator for developing a predetermined plurality of audio difference components from a source of composite baseband signal comprising:

a constant current source;

a differential amplifier comprising a first signal translating device having first, second and third electrodes and a second signal translating device also having first, second and third electrodes;

means for coupling the source of composite baseband signal to said first electrode of said first signal translating device;

means for coupling a first source of bias potential to said first electrode of said second signal translating device;

means for coupling said constant current source to said second electrode of each of said first and second signal translating devices;

means for intercoupling said second electrodes of said first and second signal translating devices;

a utilization circuit comprising four input terminals;

first switch means comprising four current splitting devices each having an input electrode coupled to said third electrode of said first signal translating device, an output electrode coupled to an assigned one of said utilization circuit input terminals and a control electrode;

second switch means also comprising four current splitting devices each having an input electrode coupled to said third electrode of said second signal translating device, an output electrode coupled to an assigned one of said utilization circuit input terminals and a control electrode; and

switch activating means for rendering, at a predetermined repetition rate, selected ones of said current splitting devices conductive

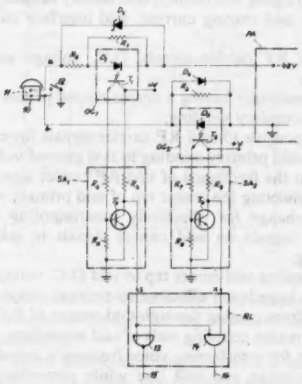
and for rendering, alternately and at said same repetition rate, the remaining ones of said current splitting devices conductive to enable said current splitting devices to translate segments of said composite signal and to collectively apply said segments to said utilization circuit input terminals to enable said utilization circuit to develop said predetermined plurality of audio difference components.

4,115,664

DISCRIMINATING NETWORK FOR TELEPHONE SWITCHING SIGNALS

Carmelo Laface, Milan, and Carlo Vantellini, Varedo, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 5, 1977, Ser. No. 784,673
Claims priority, application Italy, Apr. 6, 1976, 21954 A/76
Int. Cl.[2] H04M 3/02
U.S. Cl. 179—84 R **5 Claims**



1. In a telephone system wherein a central office is linked with a subscriber station by a line including a first and a second signal wire, said first signal wire being connected at the central office to a source of d-c voltage, said second signal wire being grounded at the central office, said subscriber station being provided with a hook switch for interconnecting said first and second signal wires to form a closed loop traversed by direct

current from said source, said subscriber station being further provided with a key for selectively grounding said second signal wire whereby current passes only through said first signal wire upon closure of said hook switch,

the combination therewith of a discriminating network comprising:

a first light-emitting diode in series with said first signal wire;

a second light-emitting diode in series with said second signal wire, said light-emitting diodes being cascaded in said loop for traverse by the same current from said source upon closure of said hook switch with said key unoperated;

a first photon detector juxtaposed with said first light-emitting diode;

a second photon detector juxtaposed with said second light-emitting diode;

first and second amplifier means respectively connected to said first and second photon detectors for generating an ouput voltage indicative of current flow in the corresponding signal wire; and

a logic circuit connected to both said amplifier means for distinguishing between current flow in both signal wires and current flow in said first signal wire only.

4,115,665
MULTIPLE CIRCUIT INTERRUPTER FOR TELECOMMUNICATION SYSTEM

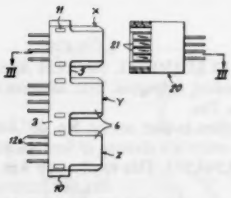
Guglielmo Giacoppo, Milan, and Ercole Tres, Cornaredo (MI), both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 5, 1977, Ser. No. 784,676

Claims priority, application Italy, Apr. 6, 1976, 21955 A/76

Int. Cl.[2] H04Q 1/14

U.S. Cl. 179—98 **6 Claims**



1. A multiple circuit interrupter facilitating the selective insertion of ancillary equipment into a multiplicity of lines of a telecommunication system, comprising:

a body of generally rectangular outline split into a central section and two lateral sections along surfaces substantially paralleling the major sides of the rectangle, said sections defining between them a multiplicity of jacks arrayed in two rows parallel to said major sides, said body having at least one transverse incision extending across said central and lateral sections whereby a plurality of identical bosses of generally rectangular outline are formed which encompass respective groups of said jacks, each jack including a pair of conductor springs normally in contact with each other; and

at least one complementary socket fitting around any one of said bosses, said socket carrying a group of plugs insertable between the conductor springs of the group of jacks of the engaged boss with a wall portion of said socket received in said incision.

4,115,666
DISCRETE 4-CHANNEL STEREO RECORDING AND/OR REPRODUCING SYSTEM COMPATIBLE WITH MATRIX SYSTEMS

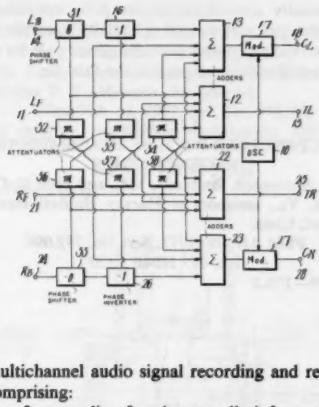
Keiichiro Ogura, Kawasaki, Japan, assignor to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Continuation of Ser. No. 541,992, Jan. 17, 1975, abandoned, which is a continuation of Ser. No. 364,934, May 29, 1973, abandoned. This application Aug. 13, 1976, Ser. No. 714,131

Claims priority, application Japan, May 30, 1972, 47-53622; Jun. 8, 1972, 47-57230; Jun. 8, 1972, 47-57232; Jun. 8, 1972, 47-57231; Jun. 15, 1972, 47-59844; May 30, 1972, 47-53621

Int. Cl.[2] H04R 5/00

U.S. Cl. 179—100.4 ST **3 Claims**



1. A multichannel audio signal recording and reproducing system comprising:

(a) means for encoding four input audio information signals designated as L_F, L_B, R_F and R_B to produce first and second transmission signals T_L and T_R and first and second carrier signals C_L and C_R; and

(b) means for recording said first and second transmission signals T_L and T_R and said first and second carrier signals C_L and C_R on a recording medium having first and second channels each of which has an audio frequency band for a transmission signal and a carrier frequency band for a modulated carrier signal, respectively, wherein said first and second transmission signals T_L and T_R and said first and second carrier signals C_L and C_R are related to four input audio information signals according to the following equations:

$$T_L = A_{LB} + L_F + mR_F - mAR_B$$

$$T_R = -mAL_B + mL_F + R_F + AR_B$$

$$C_L = -AL_B + L_F + 0\,mR_F + mAR_{B0}$$

$$C_R = mAL_B + mL_F + R_F - AR_B$$

where $A = e^{j\theta}$, $A = e^{-j\theta}$, $O < m < 1$ and $O \leqq \theta \leqq 90°$, L = left, R = right, F = front, B = back, T = transmission and C = carrier.

4,115,667
LOUDSPEAKER VOICE COIL BEARING

Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Continuation-in-part of Ser. No. 372,074, Jun. 21, 1973, Pat. No. 3,983,337. This application Mar. 22, 1976, Ser. No. 669,315

Int. Cl.[2] H04R 9/04

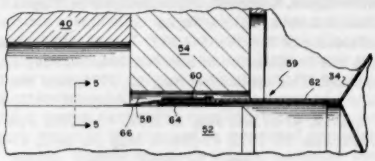
U.S. Cl. 179—115.5 VC **21 Claims**

13. In a loudspeaker, the combination comprising:

a magnetic assembly for producing an annular flux gap around a cylindrical center pole,

a tubular coil disposed around and spaced from the center pole, and

a continuous, thin, flexible bearing strip extending at least



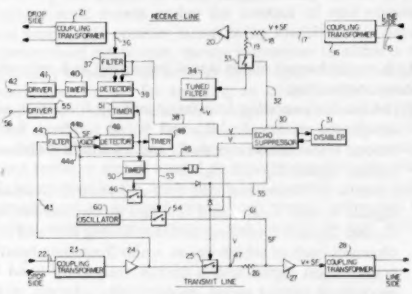
substantially around the center pole, extending axially from the coil, and extending radially inwardly from the coil into sliding contact with the center pole for maintaining the coil radially aligned in the flux gap.

4,115,668

ECHO SUPPRESSOR WITH SF TRANSMISSION AND REGENERATION

Ambroz K. Skrovanek, Bethesda, Md., and Fred E. Clark, Jr., Arlington, Va., assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Apr. 29, 1977, Ser. No. 792,096
Int. Cl.² H04B 3/20
U.S. Cl. 179—170.2 **8 Claims**



1. In an interface unit for interconnecting voice signals and preselected single frequency control signals between a drop side terminal and a four wire transmission system having receive and transmit line pairs, the unit being of the type having echo suppressor means for comparing scaled voice signal levels on the receive and transmit lines and for reducing the signal level on the one of those lines having the smaller voice signal level, and means for coupling voice signals from the transmit and receive lines to the echo suppressor means for comparison, an improved apparatus for assuring continued transmission of the single frequency control signals comprising

passive circuit means connected to the receive line pair for preventing reduction of the control signal level when said echo suppressor means reduces the voice signal level on said receive line;

circuit means for separating the transmit line into electrically isolated "drop" and "line" sides;

means coupled to said drop and line sides of said transmit line for coupling an internally generated control signal to said line side of said transmit line whenever a control signal is present on said drop side of said transmit line; and

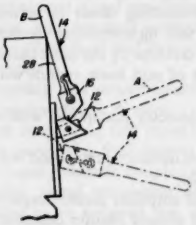
means responsive to said echo suppressor means for actuating said means for separating to couple a voice signal from said drop side to said line side of said transmit line whenever the scaled voice signal level on said receive line is lower than the scaled voice signal level on said transmit line.

4,115,669

RETRACTABLE BREAKER SWITCH TOGGLE HANDLE

Frank J. Cali, P.O. Box 279, Patterson, La. 70392

Filed May 25, 1977, Ser. No. 800,512
Int. Cl.² H01H 3/04
U.S. Cl. 200—331 **7 Claims**



1. A switch toggle operator comprising a sleeve member and a handle member, said sleeve member including first and second sections, and each section comprising first and second ends, a top portion and a bottom portion, said first end of said first section including means for telescoping over a switch toggle and said first end of said second section being integral with said handle member, said sections being joined together by a pivot means at an axis extending transversely of said sleeve member for relative angular displacement, each of said second ends including an oppositely beveled face extending from said top portion to said bottom section, said pivot means being disposed at one of said top portions and adjacent said beveled faces are closely juxtaposed when said sections are in end to end aligned position, said sleeve member including means to releasably retain said sections in said end to end aligned position.

4,115,670

ELECTRICAL SWITCH ASSEMBLY

Roy L. Chandler, Arlington, Tex., assignor to Geno Corporation, Arlington, Tex.

Continuation-in-part of Ser. No. 667,040, Mar. 15, 1976, abandoned, which is a division of Ser. No. 325,206, Jan. 19, 1973, Pat. No. 3,944,972. This application Apr. 26, 1977, Ser. No. 791,063
Int. Cl.² H01H 3/00, 15/00
U.S. Cl. 200—5 R **14 Claims**

1. Switching apparatus comprising:

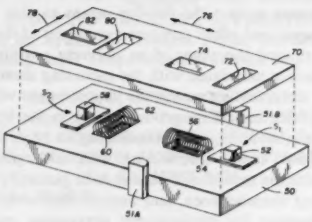
(a) a fixed base;

(b) a first slide switch characterized as a single-pole, double-throw switch which is mounted at one end of said base, and a second single-pole, double-throw slide switch mounted at the other end of the base, and the second switch being mounted in a direction which is perpendicular to the first switch, and both of said slide switches having projecting arms by which the switches are activated;

(c) a movable plate juxtaposed over said base, said plate having two spaced recesses into which the projecting arms of the two slide switches are fitted, and said recesses being sized such that movement of the plate along one axis will activate one of the slide switches and movement along an orthogonal axis will activate the other slide switch; and

(d) structural means against which a manual force may be

applied to the movable plate, so as to slide the plate with respect to the base and thereby move at least one of the



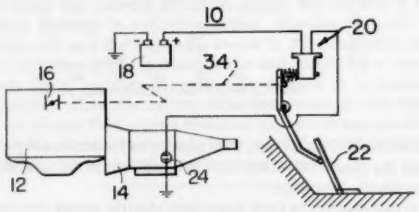
projecting arms, whereby at least one of the two slide switches will be activated.

4,115,671

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION INCLUDING SWITCH WITH LOST MOTION ACTUATOR

Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1976, Ser. No. 753,792
Claims priority, application Japan, Dec. 27, 1975, 50/157067
Int. Cl.[2] H01H *3/16*; B60K *21/00*
U.S. Cl. 200—61.91 **5 Claims**



1. A control system for an automatic power transmission of a vehicle driven by an engine the output of which is controlled by the opening degree of a throttle valve operatively connected to the accelerator pedal, said transmission having a downshift circuit for providing a shift-down operation when energized and for further providing a shift-up operation when deenergized, said control system comprising:

a snap-action switch having first and second states thereof which alternately take place in a snap-action manner, said first state being a state in which said switch closes to energize said downshift circuit and said second state being a state in which said switch opens to deenergize said downshift circuit; and

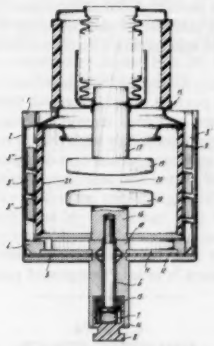
actuating means for permitting said snap-action switch to take said first state when said accelerator pedal is depressed beyond a relatively long predetermined distance corresponding to a first predetermined position of said throttle valve and to take said second state when said accelerator pedal is permitted to return to a partially depressed position corresponding to a second predetermined position of said throttle valve, the opening degree of said throttle valve at said first predetermined position being greater than that of the second predetermined position.

4,115,672

VACUUM SWITCH AND ELECTRO-MAGNETIC COIL ASSEMBLY THEREFOR

Joseph H. F. G. Lipperts, Hengelo, Netherlands, assignor to Hazemeijer B. V., Hengelo, Netherlands

Filed Feb. 18, 1977, Ser. No. 770,276
Claims priority, application Netherlands, Feb. 19, 1976, 7601690
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **4 Claims**

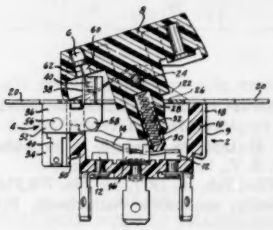


1. A vacuum switch comprising an evacuated electrically conducting cylindrical envelope having therein two contact elements which are relatively movable such that the two contact elements make electrical contact in the closed condition of the switch and are separated by an electrically insulating gap in the open condition of the switch, said gap being symmetrically disposed with respect to the central axis of said cylindrical envelope, an electro-magnetic coil disposed coaxially around said cylindrical envelope, said electro-magnetic coil being connected in series with said two contact elements when the switch is in the closed condition and producing an axial magnetic field in the region of current passage between the closed contact elements, the ends of the electro-magnetic coil being connected to respective electrically conducting joining rings one of which is connected to said electrically conducting cylindrical envelope coaxially surrounding the electro-magnetic coil and the other of which is connected to an electrically conducting disc in a central bore of which a first central conductor is mounted, one end of said cylindrical envelope extending beyond said other ring and being connected to a disc-shaped electrically conducting base, in a central bore of which a second central conductor is mounted, insulating material being provided between the electro-magnetic coil, said other joining ring and the envelope as well as between the electrically conducting disc and the disc-shaped base, one of the contact elements being connected to the first central conductor, whereas the other contact element and the second central conductor serve to connect the circuit to be controlled to the vacuum switch.

4,115,673
CURRENT COMMUTATION MEANS FOR ILLUMINATED SWITCH INDICATOR

Franklin E. Smith, Sullivan, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 16, 1977, Ser. No. 769,439
Int. Cl.² H01H 9/00
U.S. Cl. 200—315 **15 Claims**

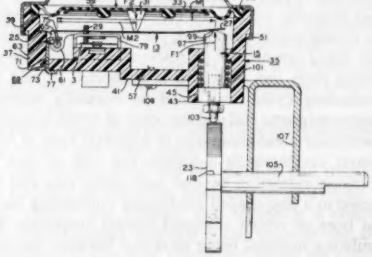


1. An electric switch comprising in combination:
a housing;
contact means mounted in said housing;
operator means movably mounted to said housing and having a portion internal of said housing for actuating said contact means and having a portion external of said housing;
an indicator lamp, including lamp terminal means, carried by said external portion of said operator means; and
attachment means mounted to said housing and supporting stationary supply terminals such that in response to movement of said operator means to a designated position said lamp terminal means and said supply terminals engage in sliding and wiping contact externally of said housing in the plane of said movement of said operator means to enable current commutation from said supply terminals to said indicator lamp for illumination of the latter when said operating means is in said designated position.

4,115,674
MOUNTING DEVICE

Stanley J. Budlane, Fulton; Dann W. Denny, and Ronald L. Hilty, both of Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 489,841, Jul. 18, 1974, Pat. No. 3,984,650. This application Apr. 19, 1976, Ser. No. 677,969
Int. Cl.² H01H 35/40
U.S. Cl. 200—329 **7 Claims**

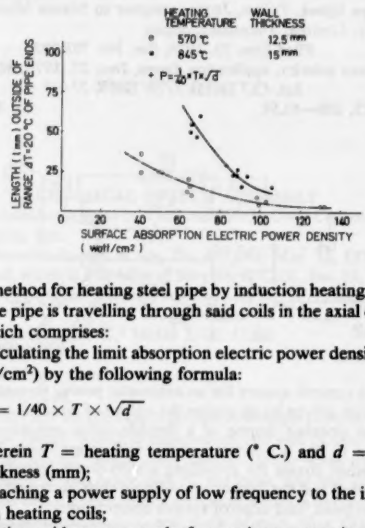


1. In a condition responsive electrical device having a housing, means movable in the housing between opposite positions for controlling a circuit through the device, means pivotally movable in the housing for effecting actuation of the controlling means, means for pivotally mounting the actuation means, means operable generally in response to the occurrence of a preselected condition for driving the actuation means to pivot it and conjointly move the controlling means toward one of its opposite positions, means selectively operable for biasing the actuation means against the driving means to also pivot the actuation means and effect conjoint movement of the controlling means toward the other of its opposite positions, and a mounting device associated with the mounting means and the housing for the actuating means; the improvement wherein the mounting device comprises groove means in the housing for supporting the mounting means including an open side, and a pair of opposed means intersecting with said open side for abutment with the mounting means so as to generally constrain its movement therebetween, and means removably arranged with the housing for displacement preventing engagement with the mounting means including means disposed geneally in overlaying relation with the mounting means for retaining it against displacement from the open side of said groove means between said abutment means, and means integral with said retaining means and extending through the housing into engagement with an exterior portion thereof for maintaining the overlaying relation of said retaining means with respect to the mounting means.

4,115,675
INDUCTION HEATING METHOD OF STEEL PIPE

Katsuhiko Narihara, Kimitsu; Hajime Nakasugi, Kisarazu, and Masanobu Yamaguchi, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 603,626, Aug. 11, 1975, abandoned. This application May 31, 1977, Ser. No. 802,195
Int. Cl.² H05B 5/06
U.S. Cl. 219—10.41 **3 Claims**



1. A method for heating steel pipe by induction heating coils, while the pipe is travelling through said coils in the axial direction, which comprises:
(a) calculating the limit absorption electric power density Po (W/cm^2) by the following formula:

$$Po = 1/40 \times T \times \sqrt{d}$$

wherein T = heating temperature (° C.) and d = wall thickness (mm);
(b) attaching a power supply of low frequency to the induction heating coils;
(c) setting said power supply for maximum capacity to be impressed on said induction heating coils, and
(d) heating the steel pipe as it is travelling through said induction heating coils heated by said power supply, at such speed as to permit the steel pipe to be heated to the desired temperature, and heating the steel pipe with the set power if the absorption electric power density P by the set power is $P \geqq Po$, and heating the steel pipe by shortening the effective length of the induction heating coils to obtain $P \geqq Po$ if $P < Po$; thereby causing the difference in the temperature between the ends and the central portion

of the steel pipe in the axial direction to be no greater than about 20° C.

4,115,676
INDUCTION HEATING APPARATUS

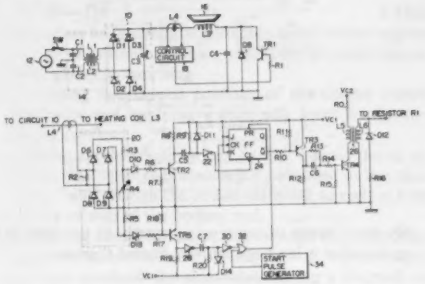
Iwao Higuchi, Ayase, and Takashi Fujita, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,116

Claims priority, application Japan, Feb. 10, 1976, 51-13541; Feb. 10, 1976, 51-13542; Feb. 10, 1976, 51-13543; Feb. 10, 1976, 51-13544; Feb. 10, 1976, 51-13545; Jul. 27, 1976, 51-89470

Int. Cl.[2] H05B 5/04

U.S. Cl. 219—10.49 R **17 Claims**



1. An induction heating apparatus comprising first and second DC power source terminals, a series circuit connected between the first and second DC power source terminals and including a series circuit of a heating coil and capacitor, unidirectional means connected in parallel with the capacitor and in a polarity-reversed relation to the first and second DC power source terminals, first switching means connected in parallel with the capacitor, a first current detection means for detecting a current through the heating coil, and a first control circuit for controlling the switching means in response to an output signal of the current detection means by supplying a first output signal to cause the switching means to be rendered nonconductive when the current detection means detects that a first current flowing in a predetermined direction through the heating coil and the switching means in the conductive state reaches a first predetermined value and supplying a second output signal to cause the switching element to be rendered conductive when the current detection means detects that a second current flowing in a direction opposite to said predetermined direction through the heating coil and the unidirectional means reaches a second predetermined value.

4,115,677
INDUCTION HEATING APPARATUS

Hideo Yamamura, Nagoya; Katsuharu Matsuo, Aichi, and Nobuyuki Nagai, Nagoya, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

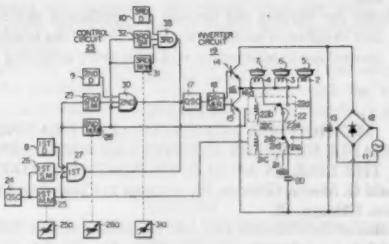
Continuation of Ser. No. 729,428, Oct. 4, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,583

Claims priority, application Japan, Oct. 2, 1975, 50/119181; Aug. 16, 1976, 51/97030

Int. Cl.[2] H05B 5/04

U.S. Cl. 219—10.49 R **8 Claims**

1. An induction heating apparatus comprising:
an inverter circuit;
a plurality of output coils for induction heating;
an output coil selection circuit for selectively connecting said each output coil to the output terminal of said inverter circuit
a control circuit for driving said output coil selection circuit and said inverter circuit so as to cyclically supply an output of said inverter circuit to selected one of said output coils for each predetermined time of a predetermined cycle;



a plurality of output adjusting devices coupled to said control circuit and adapted to set an output period of said each output coil which is included in said predetermined cycle to a desired time period.

4,115,678
MICROWAVE OVEN

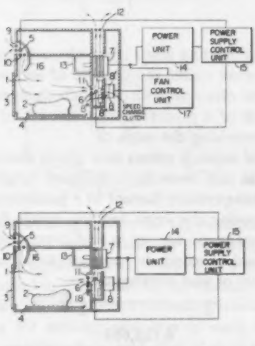
Hajime Tachikawa, and Kenji Satoh, both of Yokohama, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan

Filed Feb. 25, 1977, Ser. No. 771,914

Claims priority, application Japan, Feb. 26, 1976, 51-21957[U]

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B **12 Claims**



1. A microwave oven comprising:
a casing constituting a heating chamber for accommodating an object to be heated;
a high-frequency energy generator operative to generate high-frequency energy and feeding it to said heating chamber;
means for ventilation of air in said heating chamber, said ventilation means including a ventilation path constituted in part by the space of said heating chamber, said high-frequency energy generator being disposed on a part of said ventilation path which is outside of said heating chamber;
first heating time control means for automatically controlling the heating time for an object to be heated, said first heating time control means including temperature sensor means for sensing at least one of temperatures of the air within said heating chamber and of the air drawn out of said heating chamber and means for controlling said high-frequency energy generator to change the amount of supply of the high-frequency energy from said generator when the temperature sensed by said temperature sensor means reaches a predetermined value;
second heating time control means for manually controlling the heating time for an object to be heated;
means for selectively actuating said first and second heating

time control means to change the heating time control mode between an automatic and a manual control mode; and

means for varying the amount of ventilation achieved by said ventilation means in accordance with the heating time control mode selected by said selectively actuating means.

4,115,679

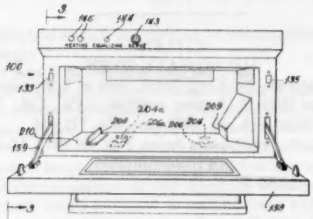
METHOD FOR AUTOMATICALLY HEATING VARIABLE NUMBERS AND SIZES OF FOOD ITEMS OR THE LIKE, IN AN ELECTROMAGNETIC OVEN

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 380,187, Jul. 18, 1973, Pat. No. 3,854,022, which is a continuation-in-part of Ser. No. 300,763, Oct. 25, 1972, Pat. No. 3,936,626. This application Sep. 9, 1974, Ser. No. 504,567

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 M **12 Claims**



1. A method of heating items using electromagnetic energy supplied to an oven under the control of an energy sensing means a magnetic characteristic of which changes in response to the absorption of a predetermined amount of electromagnetic energy comprising the steps of:

subjecting said sensing means to a given thermal environment outside said oven for a sufficient length of time to adjust the temperature thereof to a predetermined value;

thereafter exposing the items and the means for sensing to the electromagnetic energy in said oven; and

terminating said exposure in response to a change in said characteristic of said sensing means.

4,115,680

APPARATUS FOR PROVIDING TEMPERATURE EQUALIZATION CYCLES FOR A MICROWAVE OVEN

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 574,430, May 5, 1975, Pat. No. 3,999,027. This application Jun. 4, 1976, Ser. No. 692,741

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **6 Claims**

1. In an electromagnetic oven, the combination of:

a cavity in which items to be heated are placed;

means for supplying electromagnetic energy to said cavity;

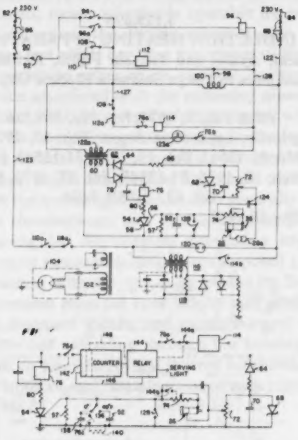
energy level detecting means for instantaneously developing an electrical signal proportional to the level of electromagnetic energy in said cavity;

control means having a first state in which electromagnetic energy is supplied to said cavity by said supply means and a second state in which said supply means is prevented from supplying energy to said cavity;

means for placing said control means in said first state;

means for integrating said electrical signal and actuating said control means to said second state when said integrated electrical signal reaches a predetermined value; and

means for establishing a holding cycle after said integrated electrical signal reaches said predetermined value in which holding cycle the rate at which said electrical signal is integrated is substantially increased so as to supply short bursts of microwave energy to the item in the cavity after it has been initially heated therein.



4,115,681

METHOD AND APPARATUS FOR CUTTING CLOTH

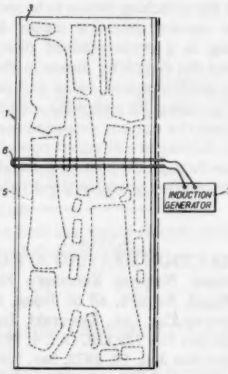
John Charles Burley, 47a Southwick St., Southwick, Brighton, Sussex, England

Division of Ser. No. 529,000, Dec. 2, 1974, Pat. No. 4,007,349, which is a continuation-in-part of Ser. No. 442,582, Feb. 14, 1974, abandoned. This application Nov. 5, 1976, Ser. No. 739,295

Claims priority, application United Kingdom, Feb. 14, 1973, 7166/73

Int. Cl.[2] H05B *5/08*

U.S. Cl. 219—10.57 **8 Claims**



1. Apparatus for cutting out a section of cloth comprising:

an electrically conductive strip element bent into the shape of a section to be cut,

cloth support means adapted to support a piece of cloth,

mounting means locating said strip element with one edge adjacent to the plane of said cloth,

an induction heating electrode positioned adjacent the side of said cloth remote from said element and adapted to heat a part only of said edge,

energy source means connected to supply high frequency electrical energy to said electrode to heat the part of the

strip element edge closest thereto to a temperature sufficient to sever the cloth, and

means to provide relative movement of said element and said electrode to progressively heat said edge to thereby sever said cloth section in a progressive manner by contact with the heated edge.

4,115,682

WELDING OF GLASSY METALLIC MATERIALS

Sheldon Kavesh, Whippany, and Gerald R. Bretts, Livingston, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 24, 1976, Ser. No. 744,658

Int. Cl.[2] B23K *11/16*

U.S. Cl. 219—118 **6 Claims**

1. A process for welding at least two metal bodies together, at least one of which comprises a metallic material that is at least 50% glassy, comprising

(a) clamping overlapped portions of the bodies between electrodes and applying a clamping force to the overlapped portions;

(b) passing an electrical current having a rapid decay such that at least 90% of the energy is delivered in less than 4×10^{-3} sec through the bodies sufficient to melt at least a portion of one of the bodies; and

(c) extracting heat from the bodies through the electrodes to cool the bodies at a rate of at least $10^{5\circ}$ C./sec by employing high conductivity electrodes having a thermal conductivity of at least about 0.30 cal/sec/cm^2/° C. to form a weld nugget having a high shear strength which is at least 25% of the tensile strength of the body having the lowest tensile strength.

4,115,683

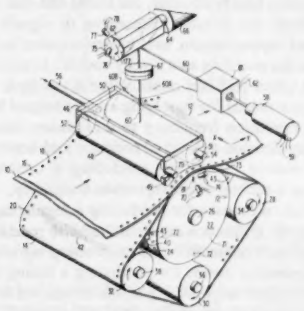
LASER PIERCING OF MATERIALS BY INDUCED SHOCK WAVES

Kendall Clark, and Milton R. Shapiro, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 533,362, Dec. 16, 1974, abandoned. This application Apr. 6, 1977, Ser. No. 785,270

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 L **9 Claims**



1. Apparatus for perforating a material comprising:

a. means for positioning said material in accurate registration in a work area;

b. a gas under pressure to be supplied to said work area;

c. means for confining said pressurized gas within the work area comprising a chamber with the material to be perforated forming a wall of said chamber;

d. a laser source and means for directing said laser beam onto said work area; said beam being periodically operative to ionize said gas above the area of said material, and generating a shock wave, said compressed gas confining the shock wave and directing it towards the material; and

e. means for removing the debris from the work area wherein the means for confining said pressurized gas comprises:

a plurality of rollers resting on said material and adapted for rotation as the material passes through the work area thereby keeping said chamber in a stationary position; and

a window to transmit said beam.

4,115,684

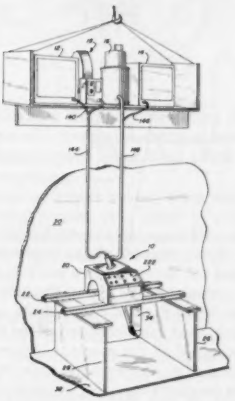
PORTABLE, PROGRAMMABLE MANIPULATOR APPARATUS

Torsten H. Lindbom, Brookfield, Conn., assignor to Unimation, Danbury, Conn.

Filed Jun. 17, 1976, Ser. No. 696,903

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—124.22 **33 Claims**



1. A portable welding system for use in shipbuilding and the like, comprising a frame, means for clamping said frame in position above a predetermined work area, a manipulator arm pivotally mounted in said frame for movement in a plurality of axes and having an end portion extending into said work area, motive means for moving said arm in each of said axes, a welding gun positioned on said end of said arm, means for disabling said motive means so that said arm may be manually moved over a desired welding path in said work area, means operative during said manual movement of said arm over said desired welding path for recording a series of digital signals corresponding to the position of said arm in each of said axes at different points along said desired welding path, and playback means controlled by said recorded digital signals for controlling said motive means to move said welding gun over said desired welding path.

4,115,685

RESISTIVE HEATING OF ELONGATED STOCK

Friedrich-Hans Grandin; Werner Fritsch, both of Ratingen, and Günter Wengenrod, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,337

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629911

Int. Cl.[2] C21D *9/62*

U.S. Cl. 219—155 **6 Claims**

1. Apparatus for resistive heating of elongated stock such as tubes, rods, wires, etc., comprising:

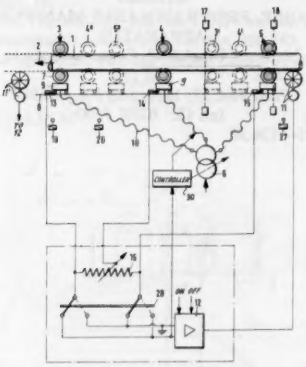
a plurality of electrodes respctively in sliding or rolling contact with the stock;

means connected for feeding current to the electrodes for passage through the stock between the electrodes;

a plurality of carriages respectively for individually mounting all of the electrodes of the plurality;

drive means for each carriage for moving the respective carriage along the stock and into the different positions corresponding to differences in spacings between the electrodes of the pluralities;

means responsive to entering and leaving of a piece of stock; and



means operated by said responsive means for controlling the drive means to obtain respectively an increasing of all the spacings between the electrodes as a piece of stock enters the apparatus, whereby a first one of the carriages carrying an electrode being the last one to make contact with the piece of stock, tracks the front end of the stock, and to obtain a decreasing of all the spacings between the electrodes as the piece of stock leaves the apparatus, whereby a last one of the carriages carrying an electrode being the first one to disengage from the piece of stock, tracks the rear end of the stock.

4,115,686

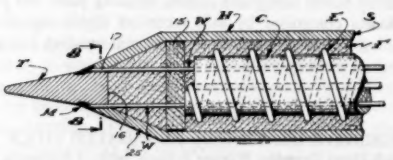
CARTRIDGE HEATER WITH IMPROVED THERMOCOUPLE

David E. Williams, and Edwin D. Hoyt, both of Hemet, Calif., assignors to Amark Industries, Inc., San Jacinto, Calif.

Continuation-in-part of Ser. No. 668,236, Mar. 3, 1976, Pat. No. 4,010,351. This application Feb. 18, 1977, Ser. No. 769,865

Int. Cl.[2] H05B *3/80*

U.S. Cl. 219—523 **11 Claims**



1. A cartridge heater with improved thermocouple comprising an elongate tubular, cylindrical metal sheath with open front and rear ends, an elongate electric and heat conducting metal plug with a rearwardly disposed rear end in tight heat conducting contact within and closing the front end of the sheath, a filler of dielectric material in the sheath rearward of the plug and an elongate resistance wire element supported by said filler, said plug having a pair of circumferentially spaced, elongate, radially outwardly opening longitudinal grooves cooperating with the sheath to define radially spaced longitudinal passages opening at the front of the sheath and at the rear end of the plug, a pair of elongate thermocouple wires extending longitudinal in the sheath and supported by said filler, said wires having front end portions in tight heat and electric conducting engagement in the passages and electrically contacting said plug at said rear end thereof, whereby said rear end of the plug establishes a thermocouple junction between the wires, weld means sealing between the plug and sheath, and sealing said passages, conductors for said wires and elements extending freely from the rear end of the sheath and means sealing said rear end of the sheath and about said conductors.

4,115,687

CIRCUIT ARRANGEMENT FOR CONTROLLING THE PULSE REPETITION FREQUENCY OF A SIGNAL

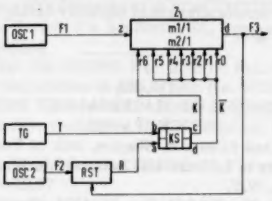
Günter Boese; Ernst Neudorfer, both of Munich, and Gero Schollmeier, Gauting, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,214

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616398

Int. Cl.[2] H03K *21/36*

U.S. Cl. 235—92 DM **7 Claims**



1. A circuit arrangement for regulating the pulse repetition frequency of a controlled signal in dependence upon the value of the pulse repetition frequency of a controlling signal comprising:

a presettable binary counter, the initial and end count values of which are settable responsive to signals coupled to control inputs therein, said binary counter including reset means for resetting said binary counter to said initial count valve when said end count value is reached,

first source means for supplying an input signal having a first pulse repetition frequency to said binary counter for frequency division therein to produce said controlled signal,

second source means for producing a controlling signal having a second pulse repetition frequency,

control circuit means for producing a regulating signal indicating the difference between the pulse repetition frequencies of said controlled and controlling signals,

clock generator means for producing a timing signal,

bistable trigger stage having inputs connected to receive said timing and regulating signals and for assuming one of two states responsive to the values of those signals, a trigger output signal indicating the state of said bistable trigger stage being produced, and

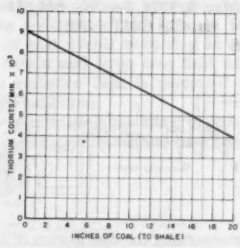
means for connecting said trigger output signal to at least one of said control inputs of said binary counter whereby in dependence on the binary value of said trigger output signal and on which of said control inputs is selected either the initial or the end count of said binary counter is varied to thereby produce a too high or to low pulse repetition frequency of said controlled signal.

4,115,688

MINING AND DRILLING CONTROL OF DISTANCE TO THE COAL-SHALE INTERFACE - THORIUM MEASUREMENT BY GAMMA SPECTROMETRY

Walter H. Fertl, Houston, Tex., and Preston L. Gant, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 31, 1977, Ser. No. 783,091
Int. Cl.[2] G01V 5/00; E21B 47/00
U.S. Cl. 250—253 10 Claims



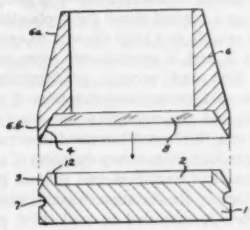
1. A method for sensing distance to shale from coal deposits comprising (1) determining the amount of gamma emission from thorium contained in shale surrounding the coal deposit; (2) measuring the amount of said gamma emission from thorium at points in the coal deposit, the distance from said points to the shale being predetermined; (3) correlating the ratio of gamma emission from (1) and (2) to provide a gamma emission to coal thickness relationship for the coal deposit; and (4) closely approximating distance from subsequent measuring points in the coal deposit to surrounding shale using the relationship determined in (3).

4,115,689

LEVELING DEVICE FOR FORMING X-RAY SPECIMEN

Vann Y. Won, 6697 Gloria Dr., Sacramento, Calif. 95831

Filed Jul. 6, 1977, Ser. No. 813,392
Int. Cl.[2] H01J 37/20
U.S. Cl. 250—272 2 Claims



1. A specimen holder and loader therefor for use in the preparation of specimens for X-ray fluorescence analysis, comprising:

a. a cylindrical holder having a chamfered end with a shallow cylindrical specimen cavity of such diameter as to leave a flat rim between the cavity edge and the chamfer, and having a circumferential groove between the chamfer and the other end; and

b. a loader in the form of a circular body having a maximum outside diameter at one end equal to the outside diameter of the holder and a somewhat smaller minimum outside diameter at the other end, and having a circular recess in its larger end defined by a tapered wall congruent with said chamfer and a bottom in the form of a flat plate;

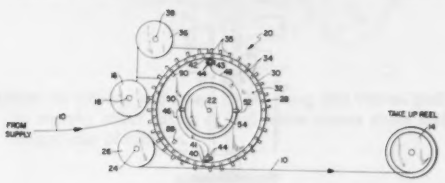
c. said loader operating when pressed over said holder, after said cavity has been slightly overfilled with the specimen material and covered with a thin plastic film, to level the specimen by expelling excess material over said rim and also to facilitate the installation of an elastic O-ring in said groove for retaining the film.

4,115,690

BACKSCATTER INSTRUMENT FOR MEASURING THICKNESS OF A CONTINUOUSLY MOVING COATED STRIP OF SUBSTRATE MATERIAL

Jacques Weinstock, Flushing; Derek Lieber, North Merrick, and William Dunning Hay, Peekskill, all of N.Y., assignors to Unit Process Assemblies, Inc., Syosset, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,250
Int. Cl.[2] G01N 23/00
U.S. Cl. 250—308 4 Claims



1. A backscatter thickness measuring device for measuring the thickness of a coating on a strip of substrate material moving at a predetermined speed from a feed supply to a take-up location comprising:

a measurement wheel having a rim and an axle of rotation and being rotated at a speed of rotation such that the tangential speed of a point on the rim is equal to the predetermined speed of the moving coated strip of substrate material;

means for feeding the coated strip of substrate material into frictional engagement with an outer portion of the rim in a direction such that the direction of movement of the coated strip of substrate material corresponds to the direction of rotation of the rim whereby a point on the rim of the measurement wheel and an adjacent point on the coated strip of substrate material are stationary relative to one another while the measurement wheel is rotating;

probe means mounted on the rim of the measurement wheel for irradiating the coating on the coated substrate material and detecting the backscattered radiation; and

counting and measurement means connected to the probe means for counting the backscattered radiation and determining the thickness of the coating in accordance with the backscatter count.

4,115,691

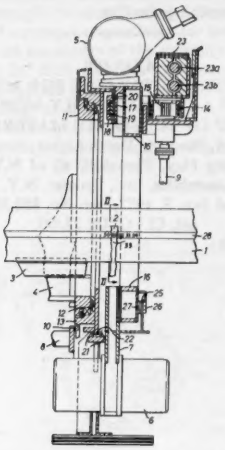
APPARATUS FOR IDENTIFYING COMPUTERIZED AXIAL TOMOGRAPHS

William Henry Oldendorf, Los Angeles, Calif., assignor to EMI Limited, Middlesex, England

Filed Dec. 8, 1976, Ser. No. 748,720
Claims priority, application United Kingdom, Dec. 23, 1975, 52525/75
Int. Cl.[2] G03B 41/16; G03C 9/00; A61B 6/00
U.S. Cl. 250—312 7 Claims

1. Radiographic apparatus including: source means for projecting penetrating radiation through a slice of the body of a patient along a plurality of substantially linear paths; detector means for detecting the radiation emergent from the body along each of said paths and for producing output signals indicative of the absorption suffered by said radiation on traversing said paths; a stack of similar indicium members disposed adjacent said body, each of which is formed of or includes material which absorbs said radiation to an extent which differs from the absorption of matter surrounding the member, said members being secured together to form a rod; and a

contact member associated with said rod and disposed to contact the under-arm of said patient and thereby to cause one



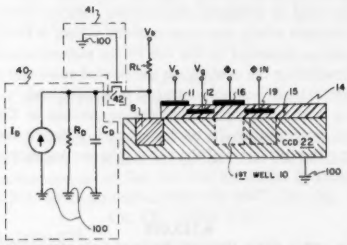
of said indicium members to intercept said radiation and thereby be associated with said slice.

4,115,692

SOLID STATE READOUT DEVICE FOR A TWO DIMENSIONAL PYROELECTRIC DETECTOR ARRAY

Raymond S. Balcerak, Alexandria, and Lynn E. Garn, Woodbridge, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1977, Ser. No. 793,688
Int. Cl.² G01J *1/00;* G01T *1/22*
U.S. Cl. 250—338 **8 Claims**



1. A solid state pyroelectric detector readout device comprising:

a readout chip semiconductor substrate having charge coupled device transfer means deposited on one surface thereof, wherein said charge coupled device transfer means is comprised of an array of solid state readout charge coupled devices having individual source inputs;

a pyroelectric retina comprised of a two dimensional pyroelectric detector array that has a scene modulated thereon for absorbing infrared radiation and producing a signal charge pattern therefrom during thermal modulation periods, wherein each of the pyroelectric detector elements of the two dimensional pyroelectric detector array is directly interfaced with one of the individual source inputs of said array of solid state readout charge coupled devices; and

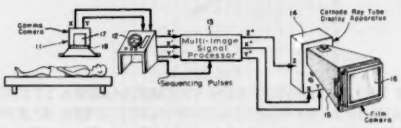
interfacing means between said two dimensional pyroelectric detector array and said individual source input wherein the intergration capability of said charge coupled device transfer means allows short thermal modulation periods for minimizing the pyroelectric detector signal losses through thermal conduction to said semiconductor substrate for eliminating the scene background flux and maximizing the dynamic range of said readout device.

4,115,693

SIGNAL PROCESSING SYSTEM FOR A GAMMA CAMERA

Neal McGrath, Alexandria, Va., assignor to Illinois Nuclear Electronics, Inc., Addison, Ill.

Filed Mar. 8, 1976, Ser. No. 664,631
Int. Cl.² G01T *1/20*
U.S. Cl. 250—363 S **6 Claims**



1. In a system for recording the distribution of a radioactive substance on film, said system including

a camera responsive to at least a portion of the emissions impinging from said substance for generating position-indicative output signals each including X, Y, and Z components of predetermined momentary duration upon each impingement;

a storage-display apparatus including a cathode-ray tube having a display screen and circuit means responsive to said output signals for producing spot images on said display screen corresponding to the locations of each of said impingements; and

a film camera for exposing a frame of film to said display screen, said film responding to application of a predetermined quantum of light from said spot images to record said spot images, the cumulative recording of said spot images on said film illustrating the distribution pattern of said radioactive substance; the improvement comprising: a signal processor including first and second sample and hold circuits disposed between said camera and said display apparatus and responsive to an applied control signal, and control circuit means responsive to said Z component for generating a control signal for application to said first and second sample and hold circuits to extend the duration of said X and Y components from said camera to respective first and second predetermined intervals greater than said momentary duration of said X and Y components, and for extending the duration of said Z component to a third predetermined interval greater than said predetermined momentary duration of said Z component but less than said first and second predetermined intervals, whereby the duration of said spot images on said display screen is extended to said third predetermined interval to allow production of said predetermined quantum of light by said cathode-ray tube at a reduced beam current for improved resolution.

4,115,694

SCINTILLATION CAMERA SYSTEM WITH IMPROVED MEANS FOR CORRECTING NONUNIFORMITY IN REAL TIME

Kai Lange, Vedbaek; Verner Toefting, Nivaa, both of Denmark; Ernest J. Wiesen, Wauwatosa, and Robert R. Lijewski, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,122
Int. Cl.² G01T *1/20*
U.S. Cl. 250—363 S **11 Claims**

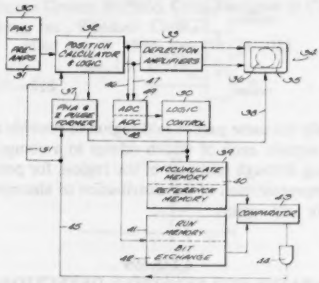
1. In a scintillation camera system comprising means respon-

sive to intercepting radiation over a relatively large area field by producing scintillation events, means for detecting said events and operative to produce corresponding electric signals, means responsive to said electric signals by producing signals which represent the positions of said events, means responsive to said signals being within predetermined limits by producing *z* signals, display means responsive to occurrence of *z* signals by producing intensity changes, respectively, corresponding substantially with the positions of said events,

improved means for correcting for nonuniformity between the positions of said events and their positions on said display means, comprising:

accumulate memory means operative during an accumulate mode to accumulate and store in binary digital form counts of said events occurring in small areas, respectively, within said large area field when a substantially uniform radiation field is presented to said means for detecting radiations,

means for terminating counting of said events when the counts corresponding with at least one of said small areas



attains a predetermined number and when counts corresponding with others of said small areas may be lower than said predetermined number,

run memory means operative during a run mode to store in binary digital form counts of said events occurring in small areas within said field corresponding with the aforesaid small areas when a body containing a radioactive substance is presented to said means for detecting radiation,

comparator means operative to continuously compare counts corresponding with counts accumulated for said small areas during said accumulation mode with counts for corresponding areas during said run mode and operative to produce a number of correlation signals substantially equal to the difference between the numbers of counts in said memories for each of said areas, respectively, and

said *z* signal producing means responding to said correction signals by causing an intensity change in a corresponding area on said display means.

4,115,695

GANTRY FOR COMPUTED TOMOGRAPHY

Arnold Lloyd Kelman, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

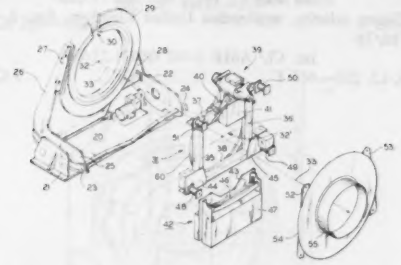
Filed Feb. 25, 1977, Ser. No. 772,188
Int. Cl.[2] A61B *6/02*; G01N *23/08*
U.S. Cl. 250—445 T **9 Claims**

1. X-ray tomographic apparatus comprising:

frame means and means for supporting said frame means for movement along a curved path about a laterally directed virtual axis to thereby enable said frame means to be tilted between opposite angles with respect to vertical,

rotatable base means supported for rotation relative to said frame means about a longitudinal axis which is perpendicular to and intersects said laterally directed virtual axis,

x-ray source and x-ray detector means mounted on said rotatable means on opposite sides, respectively, of said longitudinal axis for jointly orbiting about an examination body which may be disposed along said longitudinal axis, and



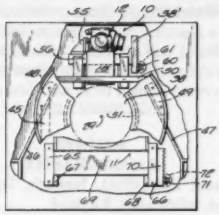
means for driving said frame means along said curved path to thereby effect tilting of said frame means about said virtual axis of rotation.

4,115,696

COMPUTED TOMOGRAPHY SCANNER

John Compton Truscott, Brookfield, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,387
Int. Cl.[2] A61B *6/00*; G01N *23/08*
U.S. Cl. 250—445 T **4 Claims**



1. Apparatus for examining a layer in a body with X-radiation comprising:

means rotatable about an axis on which an examination body may be disposed,

a source for projecting a fan-shaped beam of X-radiation originating substantially from a point, said beam being coincident with said layer and having boundary rays that diverge at a fixed angle from said point in the plane of said layer,

a generally circumferentially distributed array of X-ray detector means on a side of said axis opposite from said source disposed across said diverging beam for detecting radiation between said boundary rays after said radiation has passed across said axis, and

means for mounting said source and detector means on said rotatable means for orbiting jointly about said axis and means operable to shift said source and detector means jointly in the plane of said layer to thereby enable disposing a layer regardless of its width substantially tangentially to said boundary rays so that the projection of said layer will cover substantially the whole array of detector means.

4,115,697
X-RAY TUBE COOLING ARRANGEMENT

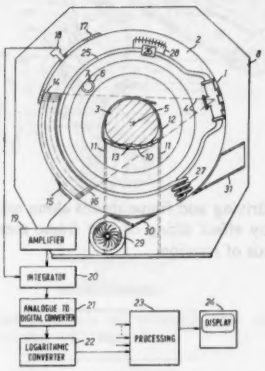
Godfrey Newbold Hounsfield, Newark, and Anthony Michael Williams, Iver, both of England, assignors to EMI Limited, Hayes, England

Filed May 17, 1977, Ser. No. 797,837

Claims priority, application United Kingdom, Jun. 2, 1976, 22719/76

Int. Cl.[2] A61B *6/00*; G01N *23/08*

U.S. Cl. 250—445 T **9 Claims**



1. A radiographic apparatus, for examining a region of the body of a patient, including: a support movable around the body; an X-ray tube mounted on said support to direct radiation through the body; a coolant circuit, connected to said tube and mounted on said support, containing coolant, which can circulate therein, and including a radiative surface at which heat can be removed from the coolant; means for moving the support, and with it the tube and coolant circuit, around the body from a defined rest position, to direct the radiation therethrough along a plurality of different paths thereafter returning to the rest position; and cooling means disposed to direct further coolant at the radiative surface when the support is in said rest position to remove heat from said first mentioned coolant.

4,115,698
RADIOGRAPHY

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Middlesex, England

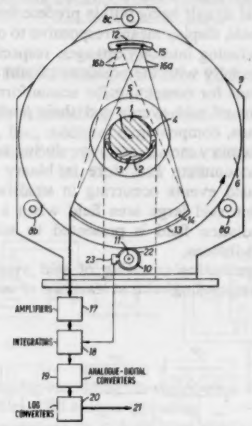
Filed Oct. 19, 1976, Ser. No. 733,941

Claims priority, application United Kingdom, Oct. 25, 1975, 43984/75

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **7 Claims**

1. Radiographic apparatus comprising: means defining a patient position; a source of a substantially planar, fan-shaped spread of X-radiation; means supporting said source so that said radiation propagates through a region of said patient position along a plurality of diverging beam paths; detecting means, also supported by said supporting means, including a plurality of detector devices each adapted to detect radiation emergent from said region along a respective one of said beam paths; scanning means for moving said supporting means, and with it said source and said detecting means, angularly around said patient position causing said source to project said radiation through said region along further beam paths and causing said detecting means to detect radiation emergent from said region along said further beam paths, each detector device producing distinguishable electrical signals relating to a plurality of said beam paths during movement of said support through a substantial angle; means causing the source of said spread of radiation to repeatedly shift with respect to said detecting means during said angular movement of the supporting means though said substantial angle so that each detector device detects sequentially, during each shift, radiation emerging from said region along several mutually inclined beam paths; and means for combining electrical signals produced by different detector devices for beam paths which pass through



substantially the same part of said region to provide composite electrical signals, each of which relates to a composite beam path passing through said part of the region, for processing to derive a representation of the distribution of absorption of the radiation in said region.

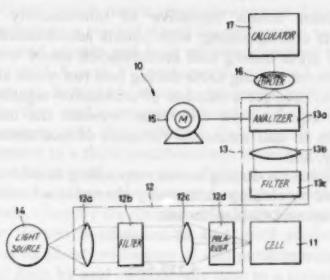
4,115,699
APPARATUS FOR SENSITIVE DETECTION AND QUANTITATIVE ANALYSIS OF BIOLOGICAL AND BIOCHEMICAL SUBSTANCES

Toshinobu Mizuta, Takasaki, and Tooru Hayashi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Nihon Kotai Kenkyujo, Japan

Filed Jun. 16, 1977, Ser. No. 807,153

Int. Cl.[2] G01N *21/38*

U.S. Cl. 250—461 B **3 Claims**



1. Apparatus for sensitively detecting and quantitatively analyzing biological and biochemical substances, which apparatus comprises: a cell for accommodating therein a test molecule labeled with a fluorescent dyestuff; an exciting optical system oriented in an X-axis or vertical direction relative to said cell for transmitting plane polarized light to excite said labeled molecule, said exciting optical system including a lens for transforming plane light originating from a light source placed in opposite relation to said cell in the X-axis direction, a filter for transmitting only monochromatic light out of the light passing through said lens, and a lens for collecting the monochromatic light from said transforming lens; a polarizing optical system oriented in a Y-axis or lateral direction relative

to said cell for taking up fluorescent light emitted from said labeled molecule, said polarising optical system including a filter and a lens each for transmitting the fluorescent light only, and an analyzer for collecting parallel and perpendicularly polarized light from said molecule; a photomultiplier for measuring the fluorescence intensities of the parallel and perpendicularly polarized light; and a calculator for computing and converting the fluorescence intensities into the degree of polarization of said molecule.

4,115,700

HIGH DENSITY FUEL STORAGE RACKS

Malcolm Duane Groves, Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 4, 1977, Ser. No. 784,012
Int. Cl.² G21F 5/00
U.S. Cl. 250—518 **16 Claims**

1. An apparatus for the safe and compact storage of a plurality of nuclear fuel assemblies within a plurality of adjacent discrete neutron absorbing open-ended shields disposed in side-by-side relationship each one of which is adapted to perimetrically encircle one of each of the nuclear fuel assemblies, wherein the theoretical minimum safe separation distance between shields is known, comprising:

a. a plurality of said shields, each having at several positions along its entire perimeter a plurality of axially spaced, outwardly protruding ridges, the heights of which are approximately one-half said separation distance, whereby contact of the ridges on adjacent shields will prevent adjacent shields from coming closer together than said separation distance;

b. a plurality of shield end fittings one of each of which is attached to each end of each of said shields, having an open center cross-section at least as large as the open cross-section of said shields and having a polygonal perimeter with an outer dimension between opposite sides of said end fitting being at least equal to the perpendicular distance between the maximum heights of said ridges on opposite sides of said shields; and

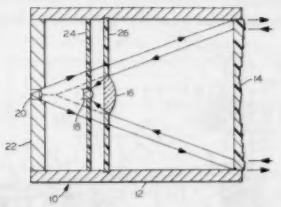
c. means for securing firm and rigid contact between each of said end fittings and all immediately adjacent end fittings in side-by-side relationship therewith.

4,115,701

COAXIAL REFLEX PHOTOELECTRIC SCANNER

Robert C. Guichard, Normal, Ill., assignor to General Electric Company, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,187
Int. Cl.² H01L 9/00
U.S. Cl. 250—552 **6 Claims**



1. A coaxial reflex photoelectric scanner comprising:

(a) a housing;

(b) a first lens mounted with said housing;

(c) a photoelectric light source mounted in said housing to radiate toward one side of said first lens and produce parallel rays of light from the other side thereof;

(d) a second lens positioned within said housing in coaxial alignment with and between said first lens and said light source; and

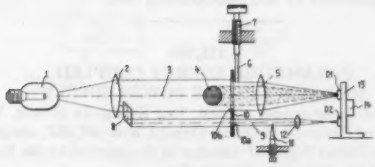
(e) a photodetection device coaxially aligned and positioned between said light source and said second lens at a point of optimum absorption of light energy which is reflected back from an object and through said first and second lens.

4,115,702

DEVICE FOR MEASURING AT LEAST ONE DIMENSION OF AN OBJECT AND A METHOD OF OPERATING SAID DEVICE

Peter Nopper, Lyss, Switzerland, assignor to Zumback Electronic AG, Orpund, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,182
Claims priority, application Switzerland, May 5, 1976, 5607/76
Int. Cl.² G01N 21/30
U.S. Cl. 250—560 **25 Claims**

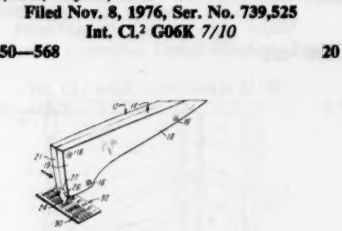


1. In a device for measuring at least one dimension of an object, comprising a light source, means defining two independent light channels for conducting light from said source to respective photo-electric transducers, means for adjusting the relative quantities of light transmitted by said channels, and a comparison circuit connected to the outputs of said transducers in order to compare the relationship between the intensities of illumination thereof, whereby when the object to be measured is introduced into one of said channels the dimension thereof can be determined in terms of the deviation of said relationship from a preset condition; the improvement wherein said photo-electric transducers are connected to the input of an amplifier of said circuit in parallel and with their polarity mutually reversed with respect to one another, and the said amplifier is provided with a negative feedback resistance connected to its output and arranged to compensate the difference between the electric currents of the said two transducers.

4,115,703
HAND HELD OPTICAL READING DEVICE

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 8, 1976, Ser. No. 739,525
Int. Cl.[2] G06K 7/10
U.S. Cl. 250—568 20 Claims



1. A hand held optical reading device comprising a housing including a head portion extending from a handle portion adapted to be held in one hand, said head portion of said housing having a forward end surface, a tip member projecting downwardly from said head portion and having a bottom surface adapted to be passed across a predetermined code carried by an article, said tip member having a forward end surface generally coplanar with said forward end surface of said head portion of said housing, a light source supported within said head portion of said housing and positioned to project a light beam onto the code adjacent said bottom surface of said tip member, a lens supported within said head portion of said housing having an optical axis, a photosensing unit disposed on said optical axis of said lens and adapted to generate electrical signals corresponding to light interruptions reflected through said lens when passing said tip member across the code, said optical axis of said lens substantially intersecting said bottom surface of said tip member and being inclined relative to said forward end surfaces of said head portion and said tip member, and electronic amplifier means enclosed within said housing and connected to amplify the signals generated by said photosensing unit.

4,115,704
PARAMETRIC ENERGY COUPLED UNINTERRUPTIBLE POWER SUPPLY

Dennis M. Hannemann, Vienna, Va.; Kwang Ta Huang, Ventura, and Dallas M. Shiroma, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1977, Ser. No. 791,458
Int. Cl.[2] H02J 9/00
U.S. Cl. 307—64 11 Claims

1. An a-c power supply circuit comprising:

a. transformer means for furnishing alternating current power to a load, said transformer means transferring power only from a primary winding to a secondary winding; said load communicating with said secondary winding of said transformer means;

b. means for connecting a source of alternating current line power to said primary winding of said transformer means;

c. backup means for converting direct current power to alternating current power and furnishing said alternating current power to said secondary winding of said transformer means;

d. power outage sensing means associated with said backup means and responsive to said line power for providing a power outage control signal for energizing said backup means when said a-c line power drops below a first predetermined threshold level;

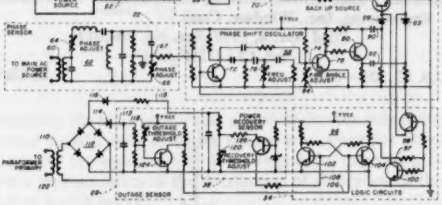
e. means for sensing the phase of said a-c line power and providing a phase control signal for controlling the phase of the a-c power generated by said backup means;

f. recovery sensing means for providing a recovery control signal for de-energizing said backup means when said a-c line power recovers to a second predetermined threshold level; said backup means including;

(1) an inverter circuit communicating with said secondary winding;

(2) means responsive to said phase control signal for driving said inverter circuit such that said inverter circuit generates a-c power in phase with said a-c line power;

(3) means responsive to said power outage control signal



and said recovery control signal for energizing and de-energizing, respectively, said inverter circuit; said energizing and de-energizing means including:

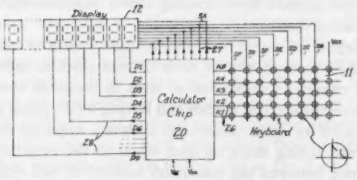
(a) a bistable multivibrator responsive to said power outage control signal and to said recovery control signal, said bistable multivibrator assuming a first state when said power outage control signal is received and assuming a second state when said recovery control signal is received; and

(b) first and second energizing transistors, responsive to said first and second state of said bistable multivibrator and communicating with said inverter driving means, for activating said inverter driving means when said bistable multivibrator is in said first state and deactivating said inverter driving means when said bistable multivibrator is in said second state.

4,115,705
ELECTRONIC CALCULATOR WITH PUSH-BUTTON ON-OFF SYSTEM

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 14, 1976, Ser. No. 695,886
Int. Cl.[2] H03K 17/60
U.S. Cl. 307—140 3 Claims



1. Power switch apparatus for a batteryoperated electronic calculator device having a plurality of pushbutton momentary contact keyswitches, a large-scale-integrated MOS semicon-

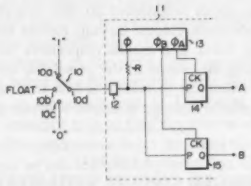
ductor device coupled to the keyswitches by a plurality of conductors, electronic circuitry within the device for processing information entered by the keyswitches, a segmented multiple digit display, means for scanning inputs of the display with scan signals, the keyswitches being in a matrix of rows and columns, the columns of the keyswitches being actuated by said scan signals, comprising: a bistable latch circuit continuously powered by the battery, a semiconductor control element in the form of an MOS transistor responsive to the condition of the latch circuit and exhibiting a low impedance when the latch is in one condition and exhibiting a high impedance when the latch is in the other condition, coupling means connecting a first of the keyswitches to the latch circuitry to cause the latch circuit to switch to said one condition upon actuation of the push-button keyswitch, means connecting said electronic circuitry to the battery only through the semiconductor control element, coupling means connecting a second of the keyswitches to the latch circuit to cause the latch circuit to switch to the other stable state upon actuation of the associated push-button, said first and second keyswitches being on the same column, the column upon which the first and second keyswitches appears being actuated continuously by a fixed potential which is different from the potential of the scan signals.

4,115,706

INTEGRATED CIRCUIT HAVING ONE-INPUT TERMINAL WITH SELECTIVELY VARYING INPUT LEVELS

Tetsuo Yamaguchi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,911
Claims priority, application Japan, May 31, 1976, 51-63063
Int. Cl.[2] H03K *19/20, 5/15*
U.S. Cl. 307—209 **6 Claims**



1. An input integral circuit comprising one input terminal to which different levels of input signals are selectively supplied; a clock pulse generator having a first, a second and a third output from which a first, a second and a third clock pulse are generated respectively; a resistor connected between said input terminal and said first output of said clock pulse generator; and an output circuit portion at least including a first latch circuit having an input connected to said input terminal and a clock input connected to said second output of said clock pulse generator and a second latch circuit having an input connected to said input terminal and a clock input connected to said third output of said clock pulse generator, in which said output circuit portion generates outputs whose logical states correspond to different levels of input signals, respectively, which are selectively supplied to said input terminal.

4,115,707

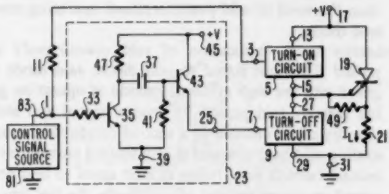
CIRCUIT FOR SINGLE-LINE CONTROL OF GTO CONTROLLED RECTIFIER CONDUCTION

Martin Aaron Kalfus, Morganville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,223
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 C **5 Claims**

1. In a circuit for operating a gate-turn-off controlled rectifier having a gate electrode, including turn-on circuit means having an input terminal receptive of a first control signal, and responsive thereto for applying an operating voltage to and supplying current to said gate electrode for turning on said gate-turn-off controlled rectifier, and turn-off circuit means having an input terminal receptive of a second control signal of the same polarity as said first control signal, and responsive thereto for applying a reference potential to and conducting current from said gate electrode, for turning off said gate-turn-off controlled rectifier, the improvement comprising:

a signal input terminal receptive of said first control signal;



resistor means connected between said signal input terminal and the input terminal of said turn-on means; and

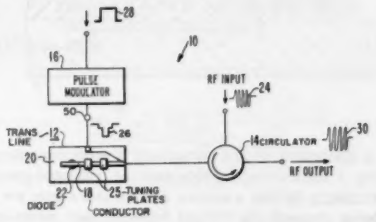
one-shot circuit means connected between said signal input terminal and said turn-off means, responsive to the trailing edge of said first control signal, for producing and applying said second control signal to the input terminal of said turn-off circuit means for a predetermined period of time, thereby permitting said turn-on circuit means and turn-off circuit means to be operated via control signals on a single control line, instead of individual control lines, respectively.

4,115,708

FAST-SWITCHING PULSE MODULATOR

Shing-Gong Liu, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 23, 1976, Ser. No. 708,219
Int. Cl.[2] H03K *5/01, 1/00, 3/335*
U.S. Cl. 307—268 **7 Claims**



1. In a microwave system including a fast-switching pulse modulator for generating and applying an output signal having first and second current levels in response to a low-power input D.C. pulse to a microwave apparatus including an avalanche semiconductor diode having a threshold value at which said diode is capable of operating in a high efficiency mode at a predetermined operating current, said diode generating, in response to a concurrently applied pulsed RF input signal, a microwave pulsed RF output signal, said system further including means for applying said pulsed RF input signal to said diode, and means for isolating the D-C. input pulse from RF signals, said modulator comprising:

a transistor having base, collector and emitter electrodes, said base and emitter electrodes being connected in a circuit to form an input circuit for said transistor for receiving said low-power input D.C. pulse, and said collec-

tor and emitter electrodes being connected in an output circuit with said diode, said diode being connected to shunt said collector and emitter electrodes; and

means for biasing the input circuit of said transistor such that said transistor is in a non-conducting mode and such that said transistor responsive to said low power input D.C. pulse is switched to a first conducting mode at a saturated condition during application of each of said low-power input D.C. pulses, said transistor in said first conducting mode generating the first output current level of said output signal, said first output current level being lower than the level of said predetermined operating current of said diode;

whereby upon application of said concurrently applied pulsed RF input signal to said diode, said diode is triggered into the high efficiency mode of operation generating thereby said pulsed RF output signal and switching thereby said transistor to a second conducting mode generating said output signal at said second current level, said second current level being at least equal to said predetermined operating current of said diode, the rise time of said RF output signal being determined by the rise time of the output current from said first current level signal to said diode operating current level.

4,115,709

GATE CONTROLLED DIODE PROTECTION FOR DRAIN OF IGFET

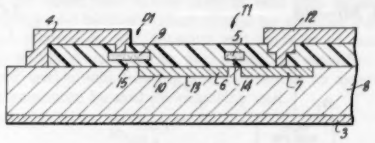
Yasukazu Inoue, and Masanori Kikuchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 595,897, Jul. 14, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,897

Claims priority, application Japan, Jun. 13, 1975, 50-71767; Jul. 16, 1974, 49-81471

Int. Cl.² H01L *27/04, 29/78, 29/90*

U.S. Cl. 307—304 **17 Claims**



1. An integrated circuit comprising a semiconductor chip including a semiconductor substrate, an insulated-gate field effect transistor having a source, a drain and a gate *p-n* junctions being respectively formed between said substrate and each of said source and drain, a plurality of bonding pads for external leads formed on said semiconductor chip, one of said bonding pads serving as an external lead for said transistor, and a protection device for preventing the gate insulator of said transistor from being destroyed by an excess electric field applied to said drain, said integrated circuit including means for connecting said protection device to said drain of said transistor, said gate being supplied with an input signal for said transistor, said drain being coupled with said one of said bonding pads, said source being supplied with a fixed voltage with respect to said substrate, said protection device including a gate-controlled diode having a *p-n* junction formed in said substrate, the breakdown voltage of said *p-n* junction of said gate-controlled diode being less than that of the *p-n* junction between said substrate and the drain of said transistor, and said gate of said transistor being electrically isolated from said drain of said transistor.

4,115,710

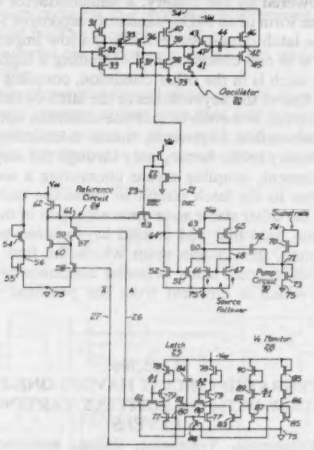
SUBSTRATE BIAS FOR MOS INTEGRATED CIRCUIT

Perry W. Lou, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,474

Int. Cl.² H03K *1/02, 3/353*

U.S. Cl. 307—304 **3 Claims**



1. A substrate pump circuit for a semiconductor integrated circuit, comprising diode means coupling a pump node to the substrate at a location on the chip removed from critical devices, generator means for producing a periodic voltage, the generator means having an output connected to the pump node and having an input responsive to the output of a reference circuit, the reference circuit having means responsive to the supply voltage level, and means responsive to threshold voltage for changing the output of the generator means from a high level voltage when the threshold is low to a regulated voltage when the threshold voltage is above a given magnitude.

4,115,711

THRESHOLD CIRCUIT WITH HYSTERESIS

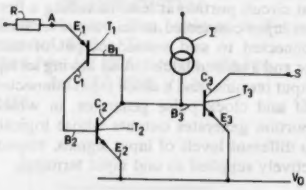
Michel Moussie, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 674,882, Apr. 8, 1976, abandoned. This application Jul. 13, 1977, Ser. No. 815,266

Claims priority, application France, Apr. 22, 1975, 75 12480

Int. Cl.² H03K *5/20*

U.S. Cl. 307—350 **10 Claims**



1. A threshold circuit with hysteresis comprising:

an input;

planar complementary first and second transistors and an output third transistor each having an emitter, base and collector; a current injector for supplying current to said output transistor; said base of each of said complementary first and second transistors being connected directly to the collector of the other complementary transistor; said emitter of said first transistor being connected to said input

of the circuit; said collector of said second transistor connected to said base of said third transistor in a d.c. path, said collector of said second transistor and said base of said third transistor being of opposite conductivity type; said emitter of said second transistor and said emitter of said third transistor being coupled directly to a common voltage reference point; and

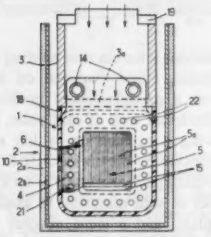
an output connected to the collector of said third transistor.

4,115,712

HIGH POWER AND HIGH SPEED LINEAR MOTOR

Jean Guimbal, Saint-Etienne, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Oct. 27, 1976, Ser. No. 736,132
Claims priority, application France, Oct. 30, 1975, 75 34533
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—12 **12 Claims**



1. A linear electric motor, comprising: an inductor unit having a system of coaxial coils each having a generally rectangular cross-section, the coils being longitudinally spaced apart by free spaces, the inductor unit also having a longitudinally extending core common to the coils and surrounded by them, the inductor unit being free of magnetic parts interposed on the system of coils; an armature unit of U-shaped cross-section surrounding the inductor unit so that the system of coils constitutes an electrically conducting layer between the core and the armature, through which layer a magnetic flux induced by the inductor passes, for moving one of the units along the other without any conduction of the flux through any local portions of the system of coils, the coils having longitudinal passages extending through them between the free spaces; and means for circulating cooling air through the passages in the coils and through the free spaces.

4,115,713

ROTOR BIAS MEANS FOR MINIATURE WATCH MOTORS OR THE LIKE

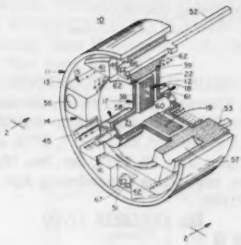
Harry H. daCosta; Victor W. Foster, both of Scottsdale, and Charles G. Thornton, deceased, late of Phoenix, Ariz. (by Ella J. Thornton, heir), assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 555,929, Mar. 6, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,919
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **2 Claims**

1. A miniature stepping motor including a nonmagnetic stator having a cylindrical cavity of predetermined dimensions, a ring yoke of high permeability and low remanance contiguously surrounding the stator, windings for producing, in response to applied current drive pulses, a magnetic field of a predetermined direction, a rotor which includes a permanent magnet member having north and south poles which is mounted on a shaft and is responsive to the magnetic field produced by the windings to be caused to step in 180° increments, comprising in combination:

the stator being a bobbin having longitudinal and traverse slots formed therein for receiving the windings and being of unibody construction;

bearing members attached at their peripheries to said stator interiorally of the windings for closing the cylindrical cavity, said bearing members including a sleeve portion, a first radially extending flange member attached to said sleeve portion at one end thereof and a second radially extending flange member attached to the other end of said sleeve portion, said second flange member supporting the ends of the shaft of the rotor; and



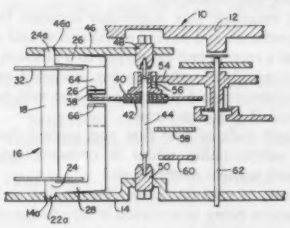
bias means for stopping the rotor of the motor in a preferential direction with respect to the magnetic field produced by the windings when energized, said bias means including at least one soft iron pin attached to the inside wall of the ring yoke externally to the windings and spaced from but extending in the same direction and along the length of the axis of the shaft of the rotor, said at least one soft iron pin establishing an uniform magnetic bias for stopping the rotor as either one of the north or the south poles thereof become aligned opposite of said at least one soft iron pin so that said rotor is stopped after being rotated 180°.

4,115,714

STEPPING MOTOR

Michael J. Ingenito, Bronx, N.Y., and Harold J. Hartnett, Norwalk, Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Mar. 4, 1976, Ser. No. 663,766
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **13 Claims**



1. A unidirectional, self-starting stepping motor comprising:

(a) a rotor having a series of permanently magnetized poles of alternating polarity disposed around an axis of rotation of said rotor;

(b) a stator including a core and an energizing winding, said core having at least one pair of pole pieces providing a pole pair having an air gap through which said magnetic poles are arranged to pass when said rotor is rotating therebetween, said energizing winding being coupled to said stator core and adapted for connection to a current source for developing an energizing flux field across said air gap between said pole pieces; and,

(c) supplemental flux conducting means including projecting

members extending from respective pole pieces in a plane parallel to the plane of rotation of said rotor, each said projecting member being mounted on one of said pole pieces to increase, parallel to the line of movement of said magnetized poles, the pole face area of said pole piece bounding said air gap with each said projecting member being disposed in alignment, across said air gap, with one of an opposed pole piece and a projecting member, and each said projecting member being arranged, also, so that aligned portions of said pole face area are disposed closer toward said plane of rotation of said rotor than the other aligned portions so that the closer aligned portions attractively influence each of said magnetized poles, when in said air gap, during operation.

4,115,715
BRUSHLESS D. C. MOTOR

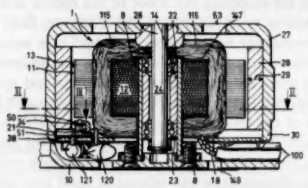
Rolf Müller, St. Georgen i.Schwarzwald, Germany, assignor to Papst-Motoren KG, St. Georgen i.Schwarzwald, Germany

Continuation of Ser. No. 565,761, Apr. 7, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,822

Claims priority, application Luxembourg, Apr. 8, 1974, 69810; Oct. 25, 1974, 71180

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 B **35 Claims**



1. A brushless d.c. motor comprising:

a stator;

a permanent magnet rotor having opposite poles and positioned with respect to said stator to provide a narrow radially directed air gap therebetween;

a stationary magnetic flux-sensitive control member;

a first magnetic flux conductor having a first end at said control member and a second end extending to a position closely adjacent a first pole of said rotor, a first narrow air gap being between said first pole and said second end of said first flux conductor;

a second magnetic flux conductor separate from said first flux conductor and having a first end at said control member and a second end extending to a position closely adjacent a second pole of said rotor, a second narrow air gap being between said second pole and said second end of said second flux conductor;

said second ends of said first and second flux conductors being substantiallly wider in cross-sectional dimension than said control member; and

at least one of said first ends of said first and second flux conductors being constricted in size to the cross-sectional dimension of said control member.

4,115,716
ROTOR OF MAGNETO GENERATOR

Nobuhiko Ogasawala, Mito; Mituo Odazima, and Yasuaki Watanabe, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

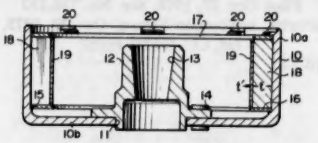
Filed Jun. 22, 1977, Ser. No. 809,006

Claims priority, application Japan, Jun. 23, 1976, 51-73233

Int. Cl.² H02K *21/22*

U.S. Cl. 310—153 **11 Claims**

1. A rotor structure for use in a magneto generator including a yoke of cup-like shape consisting of a cylindrical wall and a side wall extending from one end of said cylindrical wall, a plurality of magnets provided by permanent magnets disposed along the circumference of said cylindrical wall of said yoke in a relation circumferentially spaced apart by a predetermined distance, each said magnet having first and second flat surfaces axially facing each other, an outer peripheral surface curved to conform substantially to the curved contour of the inner surface of said cylindrical wall of said yoke and an inner peripheral surface curved to be substantially coaxial with the curved contour of the inner surface of said cylindrical wall of said yoke, said magnets being arranged in area contact with the inner surface of said cylindrical wall by means of their outer peripheral surfaces, and means for holding said magnets in



predetermined positions wherein said holding means comprises a first magnet holding plate disposed on a circumferential shoulder formed at a predetermined position on the inner surface of said cylindrical wall of said yoke, said first magnet holding plate having a surface on which said magnets are disposed in area contact by means of their first flat surfaces, a second magnet holding plate disposed in area contact with the second flat surfaces of said magnets, to axially face said first magnet holding plate, and a third magnet holding plate of cylindrical shape arranged in area contact with the inner peripheral surfaces of said magnets to press said magnets against the inner surface of said cylindrical wall of said yoke.

4,115,717
STATIONARY ANODE X-RAY TUBE

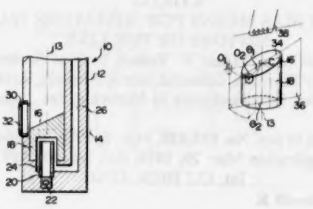
Kenji Iwasaki, and Sotaro Hijikata, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 23, 1977, Ser. No. 799,654

Claims priority, application Japan, May 26, 1976, 51/60789

Int. Cl.² H01J *35/00*

U.S. Cl. 313—59 **2 Claims**

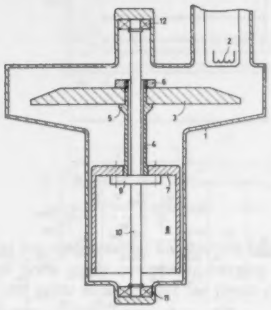


1. A stationary anode X-ray tube comprising an evacuated envelope, an anode target having an electron-impact surface inclined to a horizontal plane perpendicular to the central longitudinal axis of the anode target and hermetically fixed to one end of the envelope, and an X-ray transmitting window located on the side wall of the envelope adjacent to the anode target, the center of the window deflecting from the vertical center plane of the electron-impact surface in the circumferential direction.

4,115,718
ROTARY-ANODE X-RAY TUBE

Harry Eggelsmann, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,260
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610660
Int. Cl.² H01J 35/10
U.S. Cl. 313—60 5 Claims

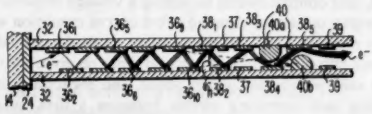


1. A rotary-anode X-ray tube, comprising a rotary anode which is journalled on two sides and including an anode disc mounted on a hollow shaft, a further shaft concentrically arranged in said hollow shaft and connected to said hollow shaft, said further shaft being journalled for connection to bearing means arranged on both sides of the anode disc.

4,115,719
ELECTRON MULTIPLIER WITH HIGH ENERGY ELECTRON FILTER

Carmen Anthony Catanese, Rocky Hill, N.J.; James Berkeley Harrison, Jr., Morrisville, Pa., and Norman Lee Lindburg, Berkeley Heights, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,281
Int. Cl.² H01J 43/10, 43/18
U.S. Cl. 313—105 R 20 Claims

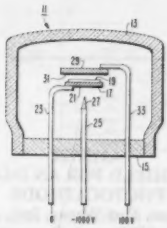


1. An electron multiplier, comprising:
at least two spaced substrates of electrically insulative material;
a cathode at one end of said substrates;
a plurality of parallel dynodes on the surfaces of said substrates which face each other, said dynodes on one of said surfaces being in staggered relation to said dynodes on the other of said surfaces;
an electron filter including at least one filter body which extends from each of said surfaces of said substrates a sufficient distance so as to substantially prevent high energy electrons from passing through said filter, said filter bodies on said surfaces being in staggered parallel relation with respect to each other and in parallel relation with respect to said dynodes, each of said filter bodies including an electrically conductive surface; and
a transition region at least a portion of which is disposed between said dynodes and said electron filter, said transition region including transition dynodes and steering electrodes on said substrates in a parallel relation to said dynodes and said filter bodies, at least some of said transition dynodes being in a staggered relation which is modified with respect to said dynodes, said steering electrodes on each substrate being in a facing relation with respect to the transition dynodes on the other substrate, there being at least three consecutive staggered transition dynodes and said electron filter being disposed between said transition dynodes so that electrons emitted from one of said transition dynodes pass through without striking said filter.

4,115,720
DEVICE HAVING THERMIONIC CATHODE HEATED BY FIELD-EMITTED ELECTRONS

Jules David Levine, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,220
Int. Cl.² H01J 1/20, 19/10
U.S. Cl. 313—337 7 Claims

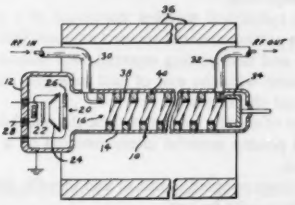


1. An electronic device comprising an evacuated envelope containing a main thermionic cathode having a first surface adapted to emit electrons when heated to elevated temperatures and an opposed second surface which is adapted to absorb energetic electrons and to convert the energy of said electrons to heat, an auxiliary field-emission cathode adapted to emit energetic electrons toward said second surface and spaced from said second surface, and means for applying a voltage between said main cathode and said auxiliary cathode, said voltage being of sufficient magnitude to cause a field emission of electrons from said auxiliary cathode with sufficient energy when absorbed by said second surface to heat said main cathode to cause thermionic electron emission from said first surface, there being no other means for heating said main cathode and said auxiliary cathode in said device.

4,115,721
TRAVELING WAVE DEVICE WITH UNIFIC COMPOSITE METAL DIELECTRIC HELIX AND METHOD FOR FORMING

Walter Friz, Yellow Springs, Ohio, assignor to Louis E. Hay, Dayton, Ohio

Filed Jan. 7, 1977, Ser. No. 757,698
Int. Cl.² H01J 25/34
U.S. Cl. 315—3.5 20 Claims



1. A traveling wave device comprising:
(a) a body member having a longitudinal tubular element;

(b) an elongated unific slow wave structure in intimate contact within the tubular element of said body member, said slow wave structure comprising a metallic core with predetermined electrical characteristics over a predetermined frequency range, and a dielectric deposition deposited to the peripheral surface of said metallic core to form said unific slow wave structure;

(c) means within said body member spaced from the first end of and coaxial with said slow wave structure for generating and projecting an electron beam through said slow wave structure;

(d) RF energy means joined to said slow wave structure, the electron beam interacting with and amplifying the RF energy flowing through said traveling wave device;

(e) magnetic means surrounding said body member for producing a magnetic field guiding the electron beam; and

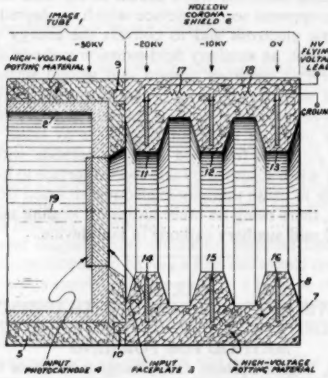
(f) collector means within said body member spaced from the second end of said slow wave structure for collecting the spent electron beam.

4,115,722

CORONA-SHIELD FOR AN IMAGE-TUBE PHOTOCATHODE

Charles Bruce Johnson, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jun. 27, 1977, Ser. No. 810,122
Int. Cl.[2] H01J *19/78*
U.S. Cl. 315—52 **6 Claims**



1. A corona-shield for an image-tube photocathode, said tube having an input faceplate adjacent said photocathode and an image-tube envelope encased in a first high voltage potting material comprising:

a hollow cylindrical member composed of a second high voltage potting material secured adjacent said photocathode to said first potting material, said hollow member is concentric with the axis of said tube and extends away from said photocathode;

a plurality of equally spaced metallic discs embedded in said second potting material interconnected by a plurality of resistors;

a high voltage coupled to one of said metallic discs adjacent said photocathode; and

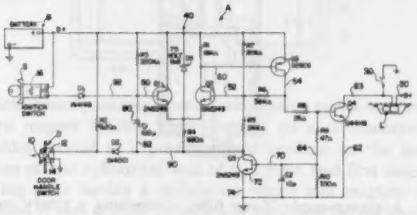
ground coupled to another of said metallic discs most remote from said photocathode.

4,115,723

CONTROL CIRCUIT FOR VEHICLE COMPARTMENT LIGHT

James C. Byrne, Farmington Hills, and Dennis D. Talmage, Canton, both of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 21, 1977, Ser. No. 817,703
Int. Cl.[2] B60Q *7/00*
U.S. Cl. 315—84 **29 Claims**

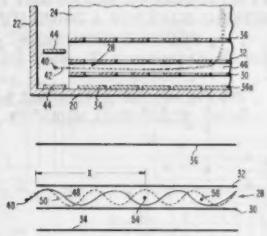


1. A control circuit for shifting a compartment light of a vehicle having a door, a control switch manually movable to an operating position upon releasing said door for opening, and an ignition switch having an actuated position and a non-actuated position, said shifting being between an illuminating condition of said light and a non-illuminating condition of said light, said control circuit including a voltage responsive input, an output, means for creating a first output condition when said input receives a voltage greater than a preselected value and a second output condition when said input receives a voltage less than said preselected given value, and switching means for shifting said operating circuit between a first, steady state condition with said operating circuit electrically floating and a second, timing condition with said operating circuit connected across a substantial voltage differential, means for holding said output at said first output condition irrespective of the voltage at said input when said operating circuit is in said steady state condition; means responsive to said first output condition for shifting said light into said non-illuminating condition and responsive to said second output condition for shifting said light into said illuminating condition; a capacitor normally discharged during said steady state condition of said operating circuit; means connecting said capacitor to said input for controlling the voltage on said input in accordance with the charged condition of said capacitor; time constant means for charging said capacitor at a given rate when actuated; means responsive to moving said control switch to said operating position for actuating said time constant means by shifting said switching means to said second, timing condition; and, means for shifting said switching means to said steady state condition in response to said capacitor being charged to a voltage applying at least said preselected given value.

4,115,724
ELECTRON BEAM OSCILLATION COMPENSATION METHOD

John Guiry Endriz, Cupertino, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,688
Int. Cl.[2] H05B 37/00, 39/00, 41/00
U.S. Cl. 315—169 TV 9 Claims

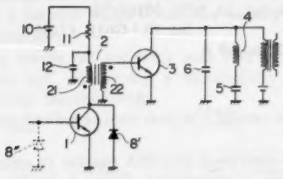


1. A method for compensating for electron beam oscillations in an electron beam guide comprising varying the electrical fields within the guide so as to alter the phase of the electron beam oscillations.

4,115,725
HORIZONTAL DEFLECTION CIRCUIT

Yoitiro Hashimoto, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 28, 1976, Ser. No. 754,957
Claims priority, application Japan, Dec. 30, 1975, 50-158258
Int. Cl.[2] H01J 29/70, 29/76
U.S. Cl. 315—403 8 Claims

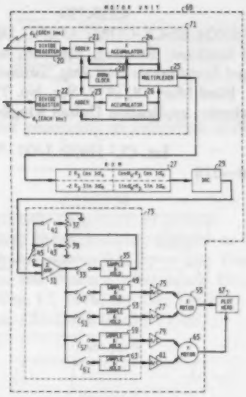


1. In a horizontal deflection circuit comprising:
a horizontal output transistor;
a horizontal deflection means connected between the collector and emitter of said horizontal output transistor and adapted to conduct a horizontal deflection current therethrough;
excitation means for generating an excitation signal to control turn-on and turn-off of said horizontal output transistor; and
an excitation transformer having a primary winding applied with said excitation signal from said excitation means and a secondary winding connected between the base and emitter of said horizontal output transistor, wherein a horizontal deflection current flows at an early stage of the horizontal scan through a series path including the base-collector junction of said horizontal output transistor and said secondary winding, the improvement comprising impedance means connected to said primary winding such that said impedance means exhibits a low impedance to a voltage induced in said primary winding by the horizontal deflection current flowing through said secondary winding at said early stage of the horizontal scan.

4,115,726
OPEN-LOOP ELECTRIC DRIVE WITH CORRECTIVE CONTROLLER

Marvin LeRoy Patterson, Ramona; Robert Dale Haselby, Escondido, and Albert Prall Kendig, Ramona, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 4, 1977, Ser. No. 756,679
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—171 11 Claims

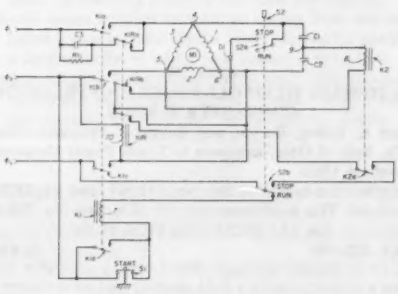


10. In an inductor-type synchronous motor having a magnetized moveable portion driven by an alternating signal having a fundamental frequency and bipolar phase currents, a method of diminishing force perturbations that occur in the motor at selected harmonics of the fundamental frequency, the method comprising the steps of:
adjusting the phase currents until the lowest frequency harmonic substantially coincides with the lowest resonant frequency of the moveable portion; and
adjusting the peak amplitude of the phase currents relative to each other until a null occurs in vibration of the moving portion.

4,115,727
BRAKING SYSTEM FOR THREE PHASE MOTORS

Thomas A. O. Gross, Concord Rd., R.F.D., Lincoln, Mass. 01773

Filed Jan. 4, 1977, Ser. No. 756,640
Int. Cl.[2] H02P 3/20
U.S. Cl. 318—212 8 Claims



1. A braking system for three phase motors having at least first, second and third accessible terminals, comprising a pair of impedances connected in series across said first and second terminals, voltage sensing circuit means connected between

said third terminal and the junction of said impedances for producing a first signal in responce to a voltage therebetween, and means responsive to an applied signal in the presence of said first signal for supplying direct current to a pair of said first and second terminals.

4,115,728

FREQUENCY-COMPARING DEVICES

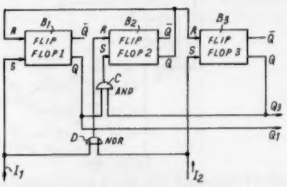
Ian Wilfrid Buckner, Reading, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Mar. 18, 1977, Ser. No. 778,922

Claims priority, application United Kingdom, Mar. 18, 1976, 10861/76

Int. Cl.[2] H02P 5/06

U.S. Cl. 318—318 **6 Claims**



1. A device for effecting a phase and frequency comparison of the pulses of two pulse sequences respectively applied at a first and a second input of the device, which comprises a first and a second flip-flop unit of the reset-set type, respectively associated with the two inputs each flip-flop unit having a 'set' inlet connected to the input with which the unit is associated and an outlet operative in the 'set' condition and inoperative in the 'reset' condition of the unit, first and second output channels connected respectively to said outlets of said first and second flip-flop units for receiving output signals from the respective flip-flop outlets; an AND gate, having two inlets respectively connected to the said first and second output channels and an outlet connected to the 'set' inlet of a third flip-flop unit, said third flip-flop unit interconnected with said first and second flip-flop units and operative in its 'set' condition to supply a 'reset' input to both said first and second flip-flop units, and means for resetting the third flip-flop unit.

4,115,729

MULTIPHASE TO SINGLE PHASE AND FREQUENCY CONVERTER SYSTEM

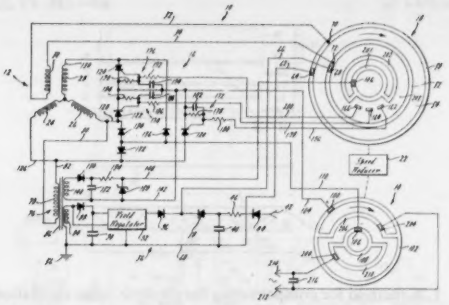
Thomas A. Young, Burton, and Ronald J. Freimark, Chagrin Falls, both of Ohio, assignors to Tenna Power Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 542,949, Jan. 22, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,791

Int. Cl.[2] H02M 5/38; F02B 63/04

U.S. Cl. 322—86 **61 Claims**

49. In an engine driven electrical energy generator system having a generator with a field winding and an armature, and an engine connected in driving relation with the generator, the engine including an ignition primary circuit generating a series of electrical pulses in response to the rotation of the engine, the improvement comprising an energy storage means connected to the ignition primary for storing at least a portion of the series of electrical pulses, means connectiang the energy storage means to the field for initially providing excitation energy to the field winding from the ignition primary and the energy storage means during the start-up of the generator, running field excitation means connected to the armature winding and field winding for providing exciting energy to



the field from the armature winding during running of the generator, and switching means for controlling the connection of said energy storage means or the armature winding to the field winding in response to said exciting energy from the armature winding bearing a preselected relationship to the voltage at said energy storage means.

4,115,730

NUCLEAR MAGNETIC RESONANCE APPARATUS AND METHODS

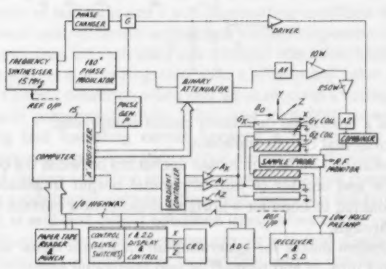
Peter Mansfield, Chilwell, England, assignor to National Research Development Corporation, London, England

Filed Apr. 7, 1977, Ser. No. 785,448

Claims priority, application United Kingdom, Apr. 14, 1976, 15295/76; Jul. 20, 1976, 30187/76

Int. Cl.[2] G01R 33/08

U.S. Cl. 324—0.5 A **9 Claims**



1. A method of obtaining a nuclear magnetic resonance spin density distribution of a sample which comprises maintaining a static magnetic field along one axis, applying a first magnetic field gradient to said static magnetic field to cause said field to vary along an axis selected from said one axis and an axis orthogonal thereto at the same time applying a selective excitation pulse so as to select at least one planar layer in the sample normal to the selected axis, removing said first magnetic field gradient and applying a second magnetic field gradient to said static magnetic field to cause said field to vary along an axis which is orthogonal to said selected axis and at the same time applying a selective excitation pulse to excite a series of strips in said at least one selected layer, and then simultaneously applying magnetic field gradients to said magnetic field to

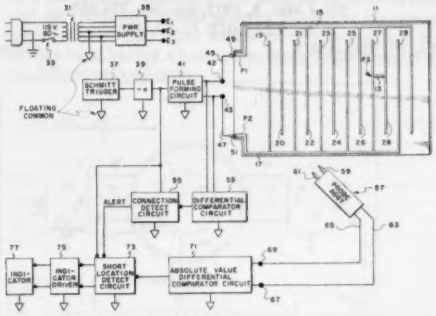
cause said field to vary in at least two of said orthogonal directions such that each point of the selected strips is subjected to a resultant magnetic field of amplitude unique to that point, and reading out the resulting free induction decay (FID) signal from said strips.

4,115,731

SYSTEM FOR LOCATING ELECTRICAL SHORTS BY TRACKING THE PATHS OF INJECTED PULSE CURRENTS UTILIZING A VOLTAGE DIFFERENTIAL RESPONSIVE PROBE

Clyde R. Axtell, III, Dallas, Tex., assignor to Digital Facilities, Inc., Dallas, Tex.

Filed Jun. 1, 1976, Ser. No. 691,475
Int. Cl.[2] G01R *31/08, 31/28, 19/16*
U.S. Cl. 324—52 **12 Claims**



1. A system for locating an electrical short between PCB conductors, said system comprising:

pulse generating means for injecting a low amplitude pulse train into the circuit path formed by said conductors and said short,

first and second probe means suitable for contacting exclusively even a narrow width conductor closely adjacent another conductor,

probe holding means for receiving said first and second probe means and maintaining a substantially constant small separation therebetween,

indicator means having at least first and second indicating states, and

means responsive to voltage differential between said first and second probe means for effecting a change in said indicator means from said first indicating state to said second indicating state only after the voltage differential between said probe means manifests reception by said probe means of at least two pulses of predetermined amplitude.

4,115,732

DETECTION SYSTEM FOR LIGHTNING

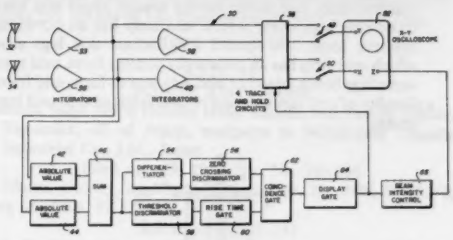
Edmund Philip Krider; Ralph Carl Noggle, both of Tucson, Ariz., and Martin Allan Uman, Gainesville, Fla., assignors to The University of Arizona Foundation, Tucson, Ariz.

Filed Oct. 14, 1976, Ser. No. 732,365
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—72 **82 Claims**

1. A direction finder for determining the direction relative to said direction finder of lightning discharges to ground characterized by one or more strokes having a substantially vertical portion extending from the ground and one or more branches above the substantially vertical portion, said substantially vertical portion and said branches each producing a field, said direction finder comprising:

means for detecting the field produced by a stroke; and

means coupled to said detecting means and responsive only to the field generated by the substantially vertical portion



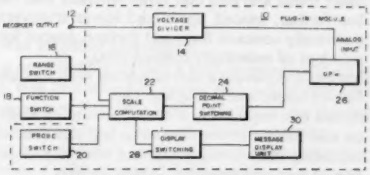
of the stroke for generating an indication of the direction of said portion.

4,115,733

DIGITAL DISPLAY PLUG-IN

Jeffrey L. Silberberg, Beltsville, Md., assignor to The United States of America as represented by of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sep. 17, 1976, Ser. No. 724,248
Int. Cl.[2] G01R *17/06, 15/08*
U.S. Cl. 324—99 D **6 Claims**



1. A metering arrangement comprising:

a parent metering system having a probe, a range switch, a function switch and an analog meter; and

a device for automatically converting analog information from said parent metering system into digital form and for displaying the information in digital form, the device including:

digital display means for converting and displaying a digital output in response to an analog signal of the parent metering system, said digital display means having one input coupled to an output from said parent metering circuit;

message display means for displaying the proper dimensions of the digital output;

scale computation means coupled to said range switch and to said function switch for processing signals received therefrom representing function and scale information;

circuit means coupled between an output from said computation means and said digital display means for positioning a decimal point in said digital display means; and

means coupled between an output from said computation means and said message display means for selecting correct message units on said message display means.

4,115,734

LAMINATED DRIVER COIL FOR RECORDER PEN DRIVE MECHANISM

Steven I. Zoltan, Shaker Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

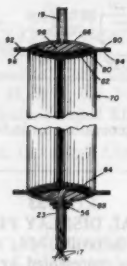
Filed Dec. 9, 1976, Ser. No. 748,833
Int. Cl.[2] G01R *5/06, 1/04*
U.S. Cl. 324—151 A **5 Claims**

1. In a driving mechanism for the pen of a recorder wherein the mechanism includes a rotatable coil assembly located in an air gap defined between an essentially cylindrical core and a

surrounding essentially cylindrical shell, an improved coil assembly, comprising:

an inner, rectangular frame formed from at least one thin resilient strip, said frame having spaced upper and lower transverse legs along which said strip has an outwardly concave form, and spaced longitudinal side legs along which said strip has an outwardly convex form, said transverse legs being joined to said side legs to form said frame;

a plurality of coil turns wound on and laminated to said inner frame;



an outer, rectangular frame formed from at least one further thin resilient strip, said outer frame being laminated to said inner frame and said coil turns whereby said outer frame has further, spaced upper and lower transverse legs of outwardly concave form and further, spaced longitudinal side legs of outwardly convex form;

a first end cap having a first mounting shaft mounted on said further upper transverse leg; and

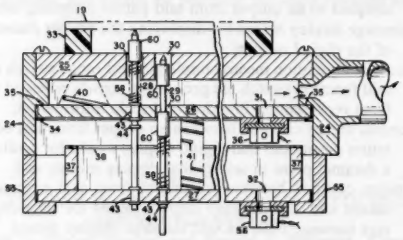
a second end cap having a second mounting shaft mounted on said further lower transverse leg, said first and second mounting shafts being positioned coaxially to permit rotation of said coil assembly in said air gap.

4,115,735

TEST FIXTURE EMPLOYING PLURAL PLATENS FOR ADVANCING SOME OR ALL OF THE PROBES OF THE TEST FIXTURE

Melvin E. Stanford, Latham, N.Y., assignor to Faultfinders, Inc., Latham, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,531
Int. Cl.[2] G01R *31/02, 15/12*
U.S. Cl. 324—158 F **18 Claims**



1. An improved circuit board testing system of the type having a test fixture for holding the circuit board being tested, said fixture containing a plurality of electrically conductive probes connected to the system and having tips for making electrical contact with selected points on the circuit board under test, wherein the improvement comprises:

a plurality of stacked and spaced-apart platens, each having a predetermined number of the probes mounted substantially upright thereon with their tips pointing substantially in the same direction and each platen having apertures therein through which probes mounted on other platens may slideably pass;

means for holding the circuit board under test and the platens in a stacked and spaced-apart relationship so that the tips of the probes mounted on a particular platen will make contact with the circuit board when that platen is advanced toward the circuit board; and

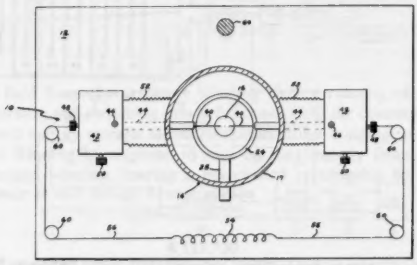
means for selectively advancing one or more platens toward the circuit board being tested whereby the tips of the probes mounted thereon will be brought into contact with their associated points in the circuit under test.

4,115,736

PROBE STATION

John M. Tracy, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1977, Ser. No. 776,037
Int. Cl.[2] G01R *31/02, 31/22*
U.S. Cl. 324—158 F **8 Claims**



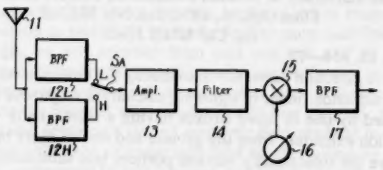
1. A probe station for the testing of specimens at preselected temperatures and pressures comprising a chamber, means operably connected to said chamber for maintaining said preselected pressure within said chamber, a container located within said chamber, a cryogenic liquid located within said container, said container having a top thereon, said top being in the form of a flat block-like platform and having a plurality of rods attached to the underside thereof, said rods being immersed within said liquid within said container, at least one contact wire in operative relationship with said specimen located on said top and means operatively connected to said contact wire for moving said wire in a plurality of directions.

4,115,737

MULTI-BAND TUNER

Masayuki Hongu, Komae; Tsutomu Niimura, Hiratsuka, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 739,275, Nov. 5, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,283
Claims priority, application Japan, Nov. 13, 1975, 50-136622
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—459 **8 Claims**



1. A tuner for receiving a broadcast signal on a selected channel of a group of channels in spaced frequency bands, said

frequency bands including a lower band comprising a plurality of lower band channels and an upper band comprising a plurality of upper band channels, said tuner comprising:

first filter, means having a fixed pass band tuned to pass said lower band signals;

second filter means having a fixed pass band tuned to pass said upper band signals;

third filter means having a pass band with an upper cut-off frequency below the second harmonic of the lowest frequency of said upper band;

switching means connected to said first and second filter means to provide a signal path through a selective one of said first and second filter means and said third filter means;

a mixer connected to said third filter means to receive the output signal thereof;

a local oscillator connected to said mixer to supply thereto a frequency-converting signal having a higher frequency than the highest frequency of a selected channel to convert the frequency of said selected channel in the output signal of said third filter means to an intermediate frequency band having a lowest frequency f_L determined by the following conditions:

$$f_L > \frac{f_S - f_P - f_B}{2}$$

and

$$f_L > \frac{f_W - f_T - f_B}{2}$$

and one of the following:

$$f_L < \frac{2f_P - f_S - f_B}{2}$$

$$f_L > \frac{2f_S - f_P - f_B}{2}$$

where:

f_B is the bandwidth of each channel,

f_P is the lowest frequency in the lower band,

f_S is the highest frequency in the lower band,

f_T is the lowest frequency in the upper band, and

f_W is the highest frequency in the upper band.

4,115,738

DIGITAL FREQUENCY SHIFT SIGNAL DEMODULATOR

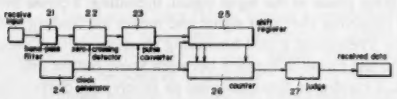
Akira Mitarai, Yamatokoriyama, and Sigekazu Fujiwara, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1977, Ser. No. 816,279

Claims priority, application Japan, Jul. 16, 1976, 51-85432

Int. Cl.[2] H03D *3/04;* **H03K** *9/06;* **H04L** *27/14*

U.S. Cl. 329—105 **3 Claims**



1. An FS signal demodulator comprising a zero-crossing detector which detects zero-crossings of frequency shift signals (FS), a pulse converter which generates a train of "0" and "1", "0" representative of a time slot from the first detected zero-crossing through a given period of time and "1" representative of a time slot from that period through the next succeeding zero-crossing, a memory means receiving the outputs of the pulse converter and thus containing the train of the pulses with the length corresponding to modulation rate, a counter means counting the number of "1's" or "0's" contained within the memory means in response to clock signals, and a determination circuit which effects frequency discrimination by comparing the counts of the counter means with a given limit.

4,115,739

POWER AMPLIFIER

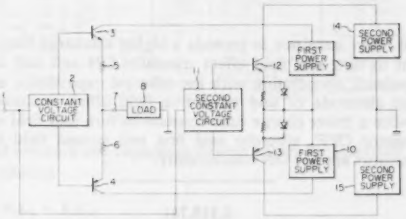
Nobuya Sano, Nara; Hiroshi Goto, Katano, and Yutaka Hirota, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 18, 1977, Ser. No. 788,324

Claims priority, application Japan, Apr. 28, 1976, 51-49248; Oct. 26, 1976, 51-129070

Int. Cl.[2] H03F *3/183*

U.S. Cl. 330—263 **23 Claims**



1. A power amplifier comprising

(a) a first amplifier for driving a load in response to an input signal, said first amplifier comprising a first complementary symmetry transistor push-pull circuit and having an operating point for Class-A or Class-B operation,

(b) a first power supply with a floating reference point for supplying a voltage to said first amplifier,

(c) a second amplifier for driving said first power supply in response to the input signal, said second amplifier comprising a second complementary symmetry transistor push-pull circuit and having an operating point for Class-AB or Class-B operation, and

(d) a second power supply with a fixed reference point for supplying a voltage to said second amplifier, said first and second power supplies each comprising a positive power supply and a negative power supply interconnected at a common junction point, and said second amplifier drives the junction point of said positive and negative power supplies of said first power supply.

4,115,740

PUSH-PULL PULSE AMPLIFIER HAVING IMPROVED TURN-ON AND TURN-OFF TIMES

Tadao Yoshida, and Tadao Suzuki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 11, 1977, Ser. No. 850,830

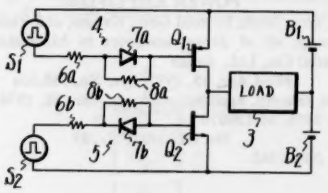
Claims priority, application Japan, Nov. 18, 1976, 51/138819

Int. Cl.[2] H03F *3/16, 3/26;* **H03K** *17/60*

U.S. Cl. 330—264 **9 Claims**

1. A pulse amplifier, comprising first and second field effect transistors, each having an input electrode and a pair of output electrodes and each exhibiting an inherent capacitance at its input electrode, said first and second field effect transistors being connected in push-pull relation such that one of the output electrodes of each of said field effect transistors is connected in common to an output terminal, the other output electrode of each of said field effect transistors is adapted to receive a DC energizing voltage and the input electrode of each of said field effect transistors is adapted to receive a pulse signal; means for supplying pulse signals; and first and second drive circuits connected between said pulse signal supply means and the input electrodes of said first and second field

effect transistors respectively, each of said drive circuits exhibiting a higher impedance when a pulse is supplied to turn the respective field effect transistor ON and a lower impedance when a pulse is terminated to turn the respective field effect transistor OFF, said higher impedance cooperating with the inherent capacitance at the input electrode of said respective



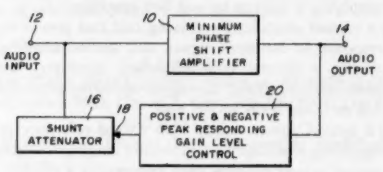
field effect transistor to provide a higher discharge time constant to turn said field effect transistor ON and said lower impedance cooperating with the inherent capacitance at the input electrode of said respective field effect transistor to provide a lower charge time constant to turn said field effect transistor OFF, whereby said first and second field effect transistors are not ON concurrently.

4,115,741

FAST ATTACK AUTOMATIC GAIN CONTROL CIRCUIT

Frank Robert Skutta, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 679,413, Apr. 22, 1976, abandoned.
This application Aug. 1, 1977, Ser. No. 820,668
Int. Cl.[2] H03G 3/10
U.S. Cl. 330—284 **8 Claims**



1. An automatic gain control circuit comprising:

an amplifier means having an input, for receiving a.c. signals, and an output, the amplifier reproducing received signals at its input at said output;

an attenuator means, coupled to the input of the amplifier means, for attenuating a.c. signal thereat responsive to a control signal; and

control means, coupled between the amplifier means output and the attenuator means, for sensing both positive and negative transitions of the a.c. signal at the amplifier means output and, in response to the instantaneous peak levels thereof, generating a control signal to control the attenuation of the attenuator means such that said instantaneous peak levels are predeterminedly gain controlled.

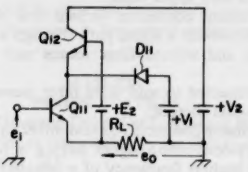
4,115,742

VARIABLE LOAD LINE POWER AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 18, 1977, Ser. No. 778,927
Claims priority, application Japan, Mar. 18, 1976, 51/28659
Int. Cl.[2] H03F 3/04
U.S. Cl. 330—297 **11 Claims**

1. In a power amplifier of the type wherein the applied source voltage to the amplifier is change in accordance with the voltage level of input signals applied to said amplifier, and including an amplifying transistor for providing to a power amplifier output terminal, an amplified output signal having a voltage level in accordance with said input signal level and further including a switching transistor, each transistor having first, second and control electrodes, said first and second electrodes defining a current path therebetween, conduction by said path being in accordance with the voltage difference between said control electrode and said second electrode, said



switching transistor conduction path being connected in series with said amplifying transistor conduction path to selectively couple said amplifying transistor to an auxiliary power source to change thereby said applied source voltage, the improvement wherein:

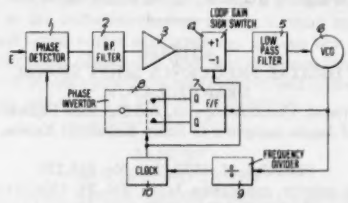
said switching transistor control electrode is coupled to said power amplifier output terminal such that said switch selectively couples said auxiliary source to said amplifying transistor in accordance with said output signal level.

4,115,743

ERROR COMPENSATING PHASE-LOCKED LOOP

Jacques Alfred Lalande, Velizy-Villacoublay, and Rene Roger Thevin, Bures sur Yvette, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 3, 1977, Ser. No. 821,388
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—14 **5 Claims**



1. A phase-locked loop adapted to provide an output signal of the same phase as the input signal, including: a phase detector for receiving the input signal and means for feeding to said detector a reference signal furnishing an error voltage proportional to the phase difference between these output and input signals, a band-pass filter coupled to receive an output signal from said phase detector to eliminate the high frequency components of the phase detector output signal, a high-gain amplifier coupled to receive the signal with eliminated components whose gain sign is switched by a clock signal, a low-pass filter receptive of amplified signals to eliminate the a-c components of the output signal of the said amplifier, a voltage-controlled oscillator controlled by the output signal from the said low-pass filter, and a phase switch supplying, from the output signal of the said oscillator, the said reference signal of the same frequency as the said input signal and whose phase is inverted on command of the said clock signal.

4,115,744
PROGRAMABLE FREQUENCY ACOUSTIC WAVE DISCRIMINATOR

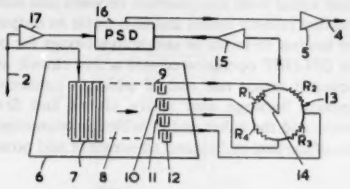
Meirion Francis Lewis, Malvern, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 717,392, Aug. 24, 1976, abandoned. This application Sep. 20, 1977, Ser. No. 835,030

Claims priority, application United Kingdom, Aug. 26, 1975, 35257/75

Int. Cl.² H03B 3/04

U.S. Cl. 331—16 **9 Claims**



1. A discriminator for use in controlling the output frequency of a voltage controlled oscillator, comprising:

an acoustic wave delay line and a phase sensitive detector arranged to measure the phase difference between signals applied to the delay line and signals received from the delay line and produce a signal representing such phase difference, wherein the delay line comprises a substrate capable of supporting acoustic waves, first and second transducer means arranged on the substrate and connected to the phase sensitive detector to launch and receive acoustic waves in and from the track, the second transducer means arranged on the substrate and connected to the phase sensitive detector to launch and receive acoustic waves in and from the track, the second transducer means comprising a plurality of transducers each spaced apart along the track at a different distance from the first transducer means, and each being capable of supporting oscillation at a number of harmonic frequencies, said difference in distance being less than one wavelength at the transducer means center frequency, and switch circuitry for selectively switching each of the plurality of transducers to the phase sensitive detector so that by sequential operation of said switching means the oscillator may be caused to oscillate any one of said harmonic frequencies such number being much greater than the number of second transducers.

4,115,745
PHASE LOCK SPEED-UP CIRCUIT

William F. Egan, Cupertino, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

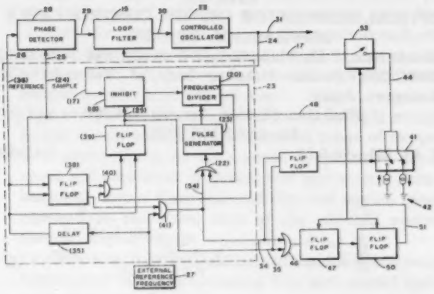
Filed Oct. 4, 1977, Ser. No. 839,330

Int. Cl.² H03B 3/04

U.S. Cl. 331—17 **8 Claims**

1. In a phase-locked loop circuit having a controlled oscillator with an output frequency f_o, a reference signal source having an output frequency f_r, logic means comprising a frequency divider responsive to frequency f_o for dividing same by a predetermined number N, said logic means also being responsive to frequency f_r and producing a first output signal when f_o/N is greater than f_r and a second output signal when f_o/N is less than f_r, a phase detector responsive to frequencies f_o/N and f_r and producing an error signal output corresponding to the phase difference between the sample pulse train at frequency f_o/N and the reference pulse train at frequency f_r, loop filter means responsive to said error signal for producing a correction signal for tuning said oscillator so as to maintain a phase-locked condition in which a predetermined fixed ratio N exists between f_o and f_r, said loop filter means comprising an integrator having a resistance R_1 and a capacitance C_1 and a low pass filter having a resistance R_4 and a capacitance C_2, said filters being connected in series, said loop filter means also having first and second stabilizing resistors R_2 and R_3, respectively, connected in series between resistor R_1 and capacitor C_1, the improvement comprising means for increasing the rate of said tuning of said oscillator comprising

means for adding direct current (DC) to a junction between resistors R_2 and R_3,



said resistors and capacitors having values for satisfying the relation

$$R_3C_1 = R_4C_2.$$

4,115,746
MULTIPACTOR DISCHARGE TUNED RESONANT CAVITY DEVICES

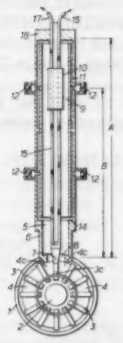
Michael Barry Brady, Maldon, and Peter Frederick Lewis, Chelmsford, both of England, assignors to English Electric Valve Company Limited, England

Filed Oct. 22, 1976, Ser. No. 734,881

Claims priority, application United Kingdom, Dec. 6, 1975, 50158/75

Int. Cl.² H03B 9/10

U.S. Cl. 331—90 **7 Claims**



1. A resonant cavity device wherein a separate resonator is coupled to a resonant cavity of said device and a multipactor discharge arrangement is provided to influence said separate resonator, said separate resonator comprising a resonant transmission path extending between said multipactor discharge arrangement and said cavity and wherein said transmission path is of such length that said multipactor discharge arrangement is positioned at least approximately at a point at which appears in operation a high radio frequency voltage and which is approximately a distance from the end of said transmission path adjacent said cavity equal to $n\lambda/4$ and said transmission path extends beyond said multipactor discharge arrangement to a total length equal to $m\lambda/2$ and is short circuited at its end

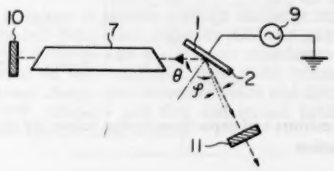
remote from said cavity, where n is one of a series of odd whole numbers including unity; λ is the wavelength corresponding to the mean frequency between the two extremes of frequency obtained as a result of initiating and inhibiting discharge of said multipactor arrangement and m is a whole number.

4,115,747

OPTICAL MODULATOR USING A CONTROLLABLE DIFFRACTION GRATING

Heihachi Sato, 7-13, Maborikaigan 3-chome, and Toda Kohji, 2069C-209, Futaba 1-chome, both of Yokosuka City, Kanagawa, Japan

Filed Dec. 27, 1976, Ser. No. 754,580
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 M **3 Claims**



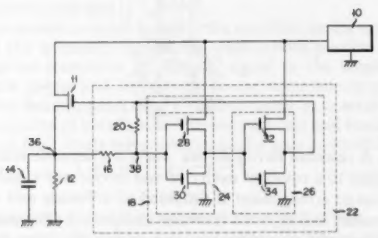
1. A controllable diffraction grating comprising an optically opaque electro-optic substrate having the property that the refractive index of the substrate depends upon the electric field applied to said substrate, an interdigital diffraction electrode mounted on a major surface of said substrate, said electrode having a plurality of pairs of adjacent parallel fingers, a plurality of terminals connected to each member of said pairs of fingers, said surface of the substrate being capable of diffracting a light beam impinging thereon from a direction perpendicular to the fingers and reflecting the diffracted light beam, the diffraction of the reflected light beam being dependent upon the electric potential applied to said interdigital diffraction electrode via said terminals.

4,115,748

MOS IC OSCILLATION CIRCUIT

Daijiro Kubo, Yamato, and Masaru Hashimoto, Ayase, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,567
Claims priority, application Japan, Mar. 18, 1976, 51-31680[U]
Int. Cl.[2] H03K *3/295, 3/353*
U.S. Cl. 331—111 **9 Claims**



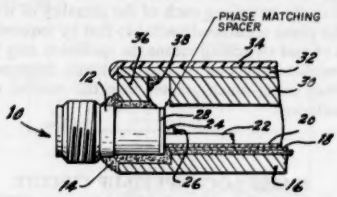
1. A complementary MOS IC oscillation circuit comprising:
a power source having a first terminal of a first potential and a second terminal of a second potential;
a series circuit including an active circuit having a control terminal and a first resistor means which are connected in series to each other to form a junction and said series connected between the first and second terminals of said power source with said active circuit being connected to said first terminal and said first resistor means being connected to said second terminal;
a Schmitt trigger circuit including cascade-connected first and second complementary MOS inverters each comprising complementary MOS FET's, a second resistor means provided between the junction of said active circuit and first resistor means and the input of said first complementary MOS inverter, and a third resistor means provided between the output of said second complementary MOS inverter and the input of said first complementary MOS inverter, said Schmitt trigger circuit adapted to receive an input signal from said junction between said active circuit and first resistor means and to provide an output signal to the control terminal of said active circuit for controlling the ON-OFF operation of said active circuit; and
a capacitor means one end of which is connected to said junction between said active circuit and first resistor means and the other end of which is connected to either one of the first and second terminals of said power source.

4,115,749

MICROWAVE HYBRID PHASE MATCHING SPACER

Sidney Michael Cole, Waverly, and Paul Lee Clouser, Vestal, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,778
Int. Cl.[2] H01P *1/18*
U.S. Cl. 333—31 R **1 Claim**

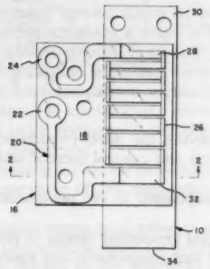


1. A microwave hybrid means for connecting coaxial and microstrip circuits and providing a phase matched connection comprising:
a box adapted to contain microstrip circuit boards;
a microstrip circuit board mounted within the box;
a cylindrically shaped female coaxial connector soldered to the box having a threaded member extending outwardly from the box and a pin positioned along the central logituding axis of the connector extending inwardly from the box, and said pin extending sufficiently to contact said microstrip circuit;
and a spacing means adapted to provide a sliding fit over said pin and mounted in juxtaposition with one end of said female coaxial connector and abutting said microstrip circuit, said spacing means further including a metal, ring shaped outer member and an inner member of dielectric material and having a thickness and dielectric constant selected for correcting phase error between said female coaxial connector and said microstrip circuit board.

4,115,750
BIMETAL ACTUATOR

Niels Junior Hansen, Camp Hill; John Ambrose Ward, Carlisle; William Hintze, Camp Hill, all of Pa., and David Charles Johnson, Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 405,223, Oct. 10, 1973, abandoned.
This application Sep. 12, 1975, Ser. No. 612,888
Int. Cl.[2] H01H *61/02*
U.S. Cl. 337—107 **9 Claims**

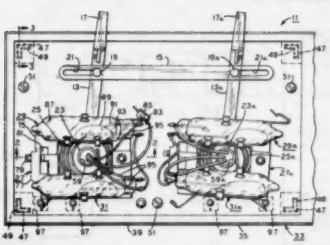


1. An improved bimetallic actuator including:
a bimetallic element comprising two metal members of different coefficients of thermal expansion bonded together, said bimetallic element adapted to be fixedly mounted by at least one side; and
a thin film resistor bonded to the high expansion side of said bimetal, said resistor including a thin film insulating substrate with a non-linear resistive circuit plated thereon in a serpentine configuration formed by a pair of spaced terminals interconnected by a continuous series of loops, each successive loop having a greater width than the preceeding adjacent loop from a first narrow width at the at least one fixed side of the bimetallic element to a second greater width remote from the at least one fixed side, whereby said element is differentially heated.

4,115,751
THERMOSTAT AND METHOD OF OPERATING SUCH

Ronald G. Huizenga, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 13, 1976, Ser. No. 750,277
Int. Cl.[2] H01H *37/12*
U.S. Cl. 337—323 **23 Claims**



1. A thermostat for regulating temperature of a space comprising:
(a) a casing including base;
(b) first and second posts rotatably mounted to said base;
(c) first and second bimetal elements adapted for movement to respective ones of adjusted positions in the thermostat and operable generally therein to sense the temperature in the space, said first and second bimetal elements each having a generally spiral configuration with radially inner and outer ends and said radially inner ends being secured to said first and second posts, respectively;
(d) first and second pairs of switches respectively operable generally for energization and de-energization at predetermined trip points thereof;
(e) first and second brackets secured to said outer ends of said bimetal elements and including first and second pairs of legs for supporting said first and second switch pairs and said legs of said first and second leg pairs being mounted for pivotal movement with respect to each other toward selected positions so as to establish the respective predetermined trip points of said switches of said first and second switch pairs, respectively;
(f) first and second temperature selectors manually movable in said casing within a predetermined range of temperature settings so as to set selected temperatures for the space and connected with said first and second posts to conjointly rotate them and said first and second bimetal elements to respective ones of the adjusted positions thereof, respectively;
(g) a connecting link disposed between said first and second temperature selectors including first and second spaced apart slots; and
(h) first and second abutments on said first and second temperature selectors extending into said first and second slots for lost motion engagement with said connecting link, said connecting link being driven in response to the engagement of one of said first and second abutments therewith to conjointly rotate both one of said first and second temperature selectors and one of said first and second posts so as to move one of said first and second bimetal elements toward a respective one of its adjusted positions maintaining one of said first and second switch pairs de-energized upon the manual movement of the other of said first and second temperature selectors toward a temperature setting defining its selected temperature, and the other of said first and second posts being rotated in response to the manual movement of said other of said first and second temperature selectors to conjointly move the other of said first and second bimetals to a respective one of its adjusted positions so as to effect the energization and de-energization operations of the other of said first and second switch pairs when said other of said first and second bimetals operates in its respective one adjusted position to sense the preselected temperature upon the occurrence thereof in the space.

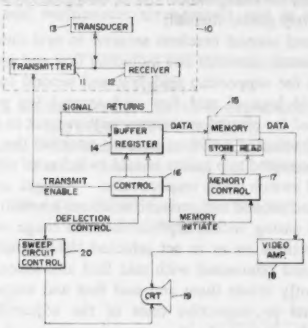
4,115,752
ECHO SOUNDING DEVICE WITH CATHODE RAY TUBE DISPLAY

Roger C. Hertel, Minneapolis, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Jun. 15, 1977, Ser. No. 806,761
Int. Cl.[2] G01S *9/68, 9/70, 7/62*
U.S. Cl. 340—3 C **2 Claims**

1. In an echo sounding device having means for transmitting sounding pulses, means for receiving signal returns from the transmitted sounding pulses and for converting the signal returns into a series of electrical signals, and a cathode ray tube having vertical and horizontal sweeps and a display face, the improvement comprising: N stage binary register means coupled to said receiving means for forming the signal returns from each transmitted pulse into a series of N segments, each stage which represents a corresponding segment being set to a binary "0" state in the absence of a received echo signal and being set to a binary "1" state upon the presence of a received echo signal; static memory means coupled to said receiving means for storing the binary-valued segmented electrical signal representations of the received signal returns from each transmitted sounding pulse; and means for feeding the stored electri-

cal signal representations of the received signal returns from the memory means to the cathode ray tube for visually displaying a plurality of said signal returns vertically side by side concurrently on the cathode ray tube face.

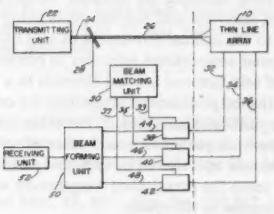


4,115,753

FIBER OPTIC ACOUSTIC ARRAY

Peter Shajenko, Storrs, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1977, Ser. No. 816,561
Int. Cl.[2] G01S *3/80*; H04R *23/00*
U.S. Cl. 340—6 R **11 Claims**



1. A fiber-optic acoustic array for detecting acoustic signals in a body of water which comprises:

a transmitting unit for generating and sending a laser beam as an output thereof;

a line array including a plurality of optic hydrophones positioned in series in a line, said line array being coupled to said transmitting unit for receiving the output thereof as an input for each of said plurality of hydrophones from said transmitting unit;

a beam matching unit including a plurality of optical delay lines, said beam matching unit being coupled to said transmitting unit for receiving as an input for each of said plurality of optical delay lines from said transmitting unit;

a plurality of photodetectors, each photodetector being coupled to a corresponding hydrophone of said plurality of optic hydrophones of said line array and to a corresponding optical delay line of said plurality of optical delay lines;

a beam forming unit coupled to said plurality of photodetectors, receiving its input therefrom; and

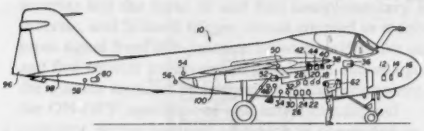
a receiving unit coupled to said beam forming unit, said receiving unit getting an input thereof from said beam forming unit.

4,115,754

AIRCRAFT ONBOARD OPERATIONAL STATUS INDICATOR

John J. Duzich, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,276
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—27 R **5 Claims**



5. An airplane having the usual pneumatic and hydraulic systems for operation and control thereof said airplane comprising:

a plurality of components in the pneumatic and hydraulic systems;

a plurality of signal generating means to provide signals of malfunction of said components and systems;

an exteriorly located ground-accessible selector read-out panel on the airplane;

indicator means grouped according to components and systems on the face of said panel to be viewable exteriorly of the airplane while on the ground for checking previous inflight and postflight operation of said components and systems, said indicator means being inclusive of fluid power system monitors, of power generation, of power processing, of power transmission, of fluid condition, of fluid source reserve, temperature, density, contamination; and component operation monitors of valves, of struts, and of actuators,

first switch means on the panel connecting signal generating means and said indicator means to activate said indicator means as are showing previous inflight and postflight component and system status; and

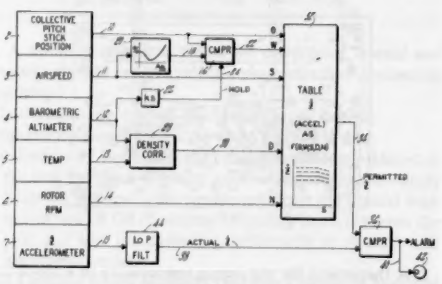
second switch means on said panel to activate said indicator means in testing their ability to function.

4,115,755

AERODYNAMIC SURFACE LOAD SENSING

Lou S. Cotton, Monroe, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 11, 1976, Ser. No. 695,501
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—27 R **4 Claims**



1. In a helicopter, navigation apparatus comprising:

speed means providing a signal indicative of the airspeed of the helicopter;

means responsive to the output of said speed means for providing a design collective pitch signal indicative of a predetermined collective pitch stick position associated with the particular speed indicated by the output signal of

said speed means as a function of the nominal weight of the helicopter, said design collective pitch signal continuously varying with airspeed in a manner according to a predetermined function;

collective pitch stick position sensing means for providing an actual collective pitch signal indicative of the actual position of the collective pitch control stick;

comparison means responsive to both of said collective pitch signals to provide an output weight signal indicative of a relationship of the actual weight of the helicopter to said nominal weight;

barometric altimeter sensing means for providing an altimeter signal indicative of the altitude of the aircraft;

differentiator means responsive to said altimeter signal to provide a hold signal indicating vertical maneuvering of the aircraft, said comparison means being responsive to said hold signal to continuously provide the last weight signal prior to the appearance of said hold signal until said hold signal disappears;

temperature sensing means for providing a signal indicative of the temperature of the atmosphere surrounding the aircraft;

density correction means responsive to said altimeter signal and to said temperature signal for providing a signal indicative of the density of the atmosphere surrounding said aircraft;

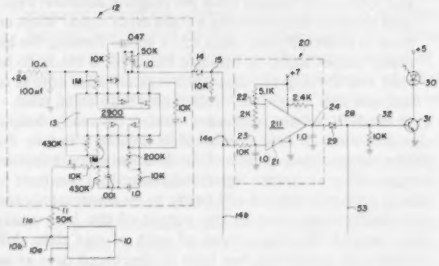
rotor speed sensing means for providing a signal indicative of rotor speed; and

means responsive to said collective pitch signal, said weight signal, said airspeed signal, said density signal, and said rotor speed signal for providing a signal in response thereto which is indicative of the aircraft acceleration corresponding to permissible loading of the aircraft within the structural envelope thereof.

4,115,756
WHEEL AND BRAKE ADVISORY SYSTEM FOR AIRCRAFT

Salvatore A. DiCecio, Irving, Tex., assignor to Avmar, Incorporated, Ronkonkoma, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,958
Int. Cl.[2] B08B *21/00*; B60T *17/22*
U.S. Cl. 340—27 R **10 Claims**



10. In an advisory system for detecting and indicating an abnormal rate of change, in one direction, of a changing function comprising

signal generating means, including transducer means responsive to a changing wheel speed function, for producing a changing DC voltage function signal which is proportional in linear relation to the change of said wheel speed function;

a comparator circuit, having two inputs and an output, for comparing two DC voltage input signals and for producing an output signal when one input signal changes polarity relative to the other input signal;

a first charging circuit, coupling the output of said signal generating means to one comparator circuit input, for producing a function input signal which tracks the changing function signal;

a second charging circuit, coupling the output of said signal generating means to the other comparator circuit input, for producing a reference input signal which tracks the changing function signal at a selected difference value relative to said function input signal and which tracks the changing function signal with a time delay greater than that of said function input signal, whereby said function input signal will change polarity relative to said reference input signal for a selected abnormally high rate of change of said function signal;

said first charging circuit comprising parallel branch circuits, including a resistance branch and a diode branch, connecting input and output points, and a capacitor coupling said output point to ground; said resistance branch including resistance means of selected value; said diode branch including diode means of selected resistance value to pass current from said input point to said output point;

said second charging circuit comprising parallel branch circuits, including a resistance branch and a diode branch, connecting input and output points, and a capacitor coupling the output points to ground; said resistance branch including resistance means of higher value than the resistance means of said first charging circuit resistance branch; said diode branch including diode means of selected resistance value to pass current from the input to the output point, said resistance value of said second charging circuit diode means being higher than the resistance value of said first charging circuit diode means;

said second charging circuit, for an increasing function signal, thereby producing a reference input signal which is lower in value than the function input signal produced by said first charging circuit;

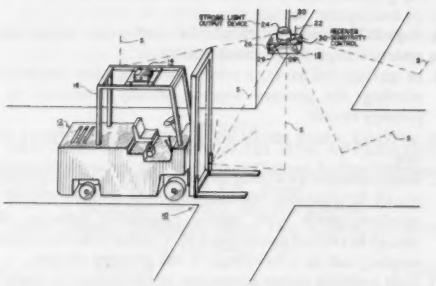
and said second charging circuit, for a rapidly decreasing function signal, producing a reference input signal which decreases slower than the function input signal produced by said first charging circuit, thereby allowing said function input signal to change polarity relative to said reference input signal;

said signal generating means including wheel speed transducer means, whereby the produced voltage function signal is proportional to the rotational speed of the wheel; said function input signal and said reference input signal thereby decreasing when said wheel speed decreases; and said system producing a comparator output signal when said wheel speed decreases at a selected abnormally higher rate due to a binding brake.

4,115,757
OMNIDIRECTIONAL VISUAL VEHICULAR WARNING SYSTEM

Charles Stephen Blahunka, 993 Marlene Ave., Elgin, Ill. 60120

Filed May 3, 1976, Ser. No. 682,508
Int. Cl.[2] G08G *1/00*; H04B *7/26*
U.S. Cl. 340—32 **8 Claims**



8. A vehicular warning system for use with lift truck surface

vehicles of the type which routinely traverse given fixed locations comprising:

a receiver fixedly mounted at one of said given fixed locations, said receiver having an antenna network and being adapted to detect radiated energy signals of a predetermined frequency and above a given minimum signal threshold, and said receiver having a decoder responsive to the detected radiated signals for providing an output signal indicative thereof;

a visual light output device providing a substantially omnidirectional pulsating light output and being fixedly mounted in proximity to said receiver and coupled to receive said output signal, wherein said device illuminates substantially entirely said one given fixed location in response to said output signal, and

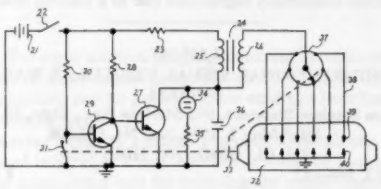
at least one transmitter fixedly mounted to the upper surface of the roll cage of one of said surface vehicles and continuously generating said energy signals when said one of said vehicles is moving, said transmitter having an antenna network integrally formed with an enclosure of said transmitter and being adapted to continuously radiate said continuously generated energy signals but at levels sufficient to exceed said minimum signl threshold only when said transmitter is within a given distance from said receiver and wherein said one of said surface vehichles is substantially continuously pulsatingly illuminated by the pulsating light output of said device throughout the interval when said one of said surfce vehicles is traversing said one given fixed location, said transmitter including an enclosure having integral means for adjusting the levels of the radiated energy, and wherein said transmitter is powered by the primary power source of said one of said vehicles and wherein said one of said vehicles includes a seat switch coupled between said primary power source and said transmitter to provide an operator responsive on-off switch which applies power to said transmitter when said switch is closed.

4,115,758

VISUAL TEST INDICATOR FOR IGNITION SYSTEMS

Frank K. Luteran, Rd. #1, Montdale, Pa. 18447

Filed Apr. 21, 1975, Ser. No. 570,076
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 R **8 Claims**



1. A visual indicator for an internal combustion engine ignition system comprising in combination;

a. an ignition coil having a primary winding and a secondary winding, the primary winding serially connected in a primary circuit;

b. a voltage source producing a current in the primary circuit;

c. semiconductor switching means connected in the primary circuit for changing the current in the primary circuit in synchronization with engine crankshaft rotation, the change in current producing a H.V. pulse in the secondary winding and an overvoltage in the primary circuit;

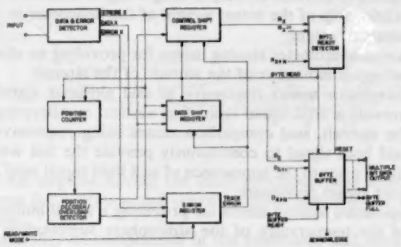
d. light emitting means connected in the primary circuit in parallel with the primary winding and energized when the overvoltage occurs in the primary circuit.

4,115,759

MULTIPLE BIT DESKEW BUFFER

Edward Roald Besenfelder, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 8, 1977, Ser. No. 822,476
Int. Cl.[2] G06K *5/04*
U.S. Cl. 340—146.1 F **8 Claims**



1. In a data processing system which utilizes a plurality of apparatus for reading digital data from mass storage devices and a plurality of data and error detectors, a multiple bit deskew buffer comprising:

a plurality of bit tracking and storing sections, each of said sections comprising:

a position counter responsive to a one of said plurality of data and error detectors for determining the number of bits stored in the section;

a position decoder/overload detector responsive to the outputs of the position counter for providing individual error signals and a digital count of the number of bits stored in the section;

a control shift register responsive to said digital count and to the data and error detector for providing a bit ready output signal indicating that a bit of data from that section is now ready to be read;

a data shift register responsive to said digital count and to the data and error detector for providing a data output corresponding to the bit ready output signal of the control shift register; the data shift register also providing means for storing a plurality of data bits;

an error register responsive to the data and error detector and to the error signals from the position decoder/overload detector for providing a track error signal when an error is detected, said track error signal forcing the bit ready output signal to indicate that a bit is ready to be read and forcing the data shift register data output to indicate that a logic "0" data bit is ready to be read;

a byte ready detector responsive to the bit ready output signal of each of said control shift registers and to the strobe output signal of each of the data and error detectors for providing an output signal indicating that one byte of data is properly aligned and ready to be transmitted, and

a byte buffer responsive to the output of the byte ready detector and the data output of each of said data shift registers for providing one byte of deskewed data as an output.

4,115,760

FIGURE PRE-PROCESSING DEVICE

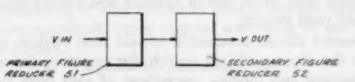
Chiaki Ito, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 631,149, Nov. 11, 1975, abandoned. This application May 12, 1977, Ser. No. 796,366
Claims priority, application Japan, Nov. 18, 1974, 49-133057
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 H **1 Claim**

1. A figure pre-processing device of a figure recognition system consisting of scanning means for scanning a figure and providing a picture signal in accordance with said scanning,

quantizing means connected to the scanning means for quantizing said picture signal into "0" and "1" signals and figure reducing means connected to the quantizing means for focusing on each point of the figure to be scanned and deleting in accordance with such focusing a picture signal of a point focused on when the picture signal pattern of points around said point is equal to any of a plurality of previously determined patterns, said figure pre-processing device comprising

a plurality of figure reducing circuits included in the figure reducing means of the figure pre-processing device, said figure reducing circuits being connected in series, each of said figure reducing circuits comprising shift register means for shifting the picture signal provided in series by the quantizing means or provided by another of said figure reducing circuits in synchronism with the scanning of the scanning means, each of said shift register means having a plurality of parallel outputs from a plurality of previously determined bit positions corresponding to each point of a picture signal pattern of points around the point focused on and storing and comparing means for storing deletion judging patterns classified into a plurality of groups and for comparing the picture signal pattern with the previously determined judging patterns wherein the point focused on is excluded from a group of the plurality of groups in accordance with patterns rotated 180 radial degrees around the point focused on, the classified groups being supplied to the series-connected figure reducing circuits as a deletion judging pattern for deleting a point in said figure reducing circuits, the judging patterns in each of the figure reducing circuits being different from those



of the others, said storing and comparing means being supplied with the picture signal corresponding to each point of the picture signal pattern at points around the point focused on as the address, said storing and comparing means comprising read only memory means having a memory area of the address corresponding to the deletion judging pattern and storing in said memory area information instructing the deletion of the picture signal of the point focused on, the read only memory means of a first of the figure reducing circuits storing "0" in the words of an address corresponding to a predetermined number of the plurality of previously determined patterns and storing "1" in the other words so that said first of said figure reducing circuits deletes the point focused on only when the pattern around said point focused on is the same as any of the predetermined number of the plurality of previously determined patterns, and the read only memory means of the next-succeeding one of the figure reducing circuits storing "0" in the words of an address corresponding to a predetermined number of additional previously determined patterns derived from the plurality of previously determined patterns by rotating each of them 180° around the point focused on and storing "1" in the other words so that said next-succeeding one of said figure reducing circuits deletes the point focused on only when the pattern around said point focused on is the same as any of the predetermined number of additional previously determined patterns, no pattern of the group of additional previously determined patterns being the same as a pattern of the group of previously determined patterns from which it is derived.

4,115,761

METHOD AND DEVICE FOR RECOGNIZING A SPECIFIC PATTERN

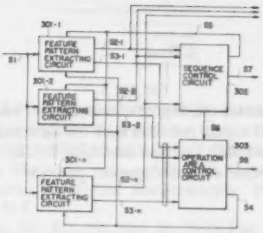
Hirotada Ueda; Takeshi Uno, both of Sayama; Masakazu Ejiri, Tokorozawa; Sadahiro Ikeda, Tokyo, and Shinji Matsuoka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 7, 1977, Ser. No. 766,486

Claims priority, application Japan, Feb. 13, 1976, 51-14030; Feb. 13, 1976, 51-14031

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **13 Claims**



1. In a device for recognizing the presence of a specific object pattern on an information pattern, a recognition method comprising:

a first step of inputting the information pattern including an object pattern having at least a first and a second feature parts of specific shape;

a second step of extracting information from said information pattern indicating the presence of said first feature part of specific shape and its position coordinates on said information pattern;

a third step of determining a certain extracting area on the basis of said position coordinate information of said first feature part of specific shape and extracting said second feature part of specific shape existing in said extracting area and the position coordinates therefor;

a fourth step of determining at least a first coordinate identifying the position of a third feature part from the position coordinates of at least one of said first and second feature parts;

a fifth step of sequentially cutting out partial patterns in an area related to said first coordinate determined in said fourth step from among the information picked up in said first step and determining the position coordinates for these partial patterns;

a sixth step of extracting the presence and at least a second coordinate identifying the position of said third feature part from among said sequentially cut out partial patterns;

a seventh step of recognizing feature parts contained in said sequentially cut out partial patterns and generating a signal representative thereof; and

an eighth step of selecting a signal output generated in said seventh step as the desired character recognition signal when the position coordinates of said sequentially cut out partial pattern in which said feature recognized in said seventh step is located substantially matches the position coordinates of said third feature part determined in said fourth and sixth steps.

4,115,762

ALIGNMENT PATTERN DETECTING APPARATUS

Nobuyuki Akiyama, and Yoshimasa Oshima, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 30, 1977, Ser. No. 856,096

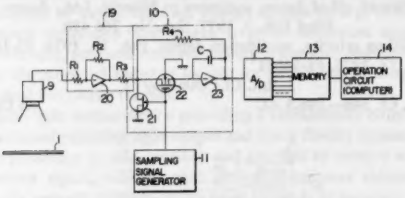
Claims priority, application Japan, Dec. 1, 1976, 51-143355

Int. Cl.[2] G01J *1/20*

U.S. Cl. 340—146.3 H **5 Claims**

1. An alignment pattern detecting apparatus comprising an image pick-up device for scanning and picking up an optical

image of a registration pattern formed on a wafer, the direction of the scanning being in a direction transverse to the lengthwise direction of the pattern, and means for symmetrically returning a video signal obtained from said image pick-up



device to determine the degree of matching of said video signal with the video signal returned and for determining a return point associated with the best matching to detect said return point as the center of said alignment pattern.

4,115,763

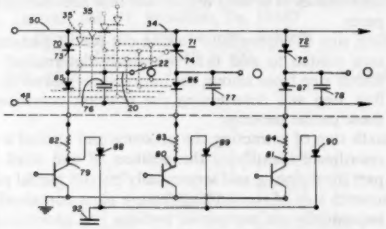
ELECTRICAL SWITCHING SYSTEM

Arling Dix Brown, Jr., Cleveland Hts., and Edward Justus Reilly, Mayfield Hts., both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 671,427, Mar. 29, 1976, Pat. No. 4,058,814. This application Jan. 10, 1977, Ser. No. 758,102

Int. Cl.[2] G01D *15/06;* **G11C** *5/02, 11/36*

U.S. Cl. 340—166 R **10 Claims**



1. A switching system comprising:

a first diode circuit having a first high stored charge diode;

switch means in series with said first high stored charged diode;

means for impressing a forward voltage across said high stored charge diode and said switch means whereby when said switch means is closed and said forward voltage is impressed, a current flows through said high stored charge diode;

an output connected to the cathode of said first high stored charge diode; and

means for impressing a reverse voltage across said first high stored charge diode, whereby when said switch means is closed and said reverse voltage is impressed, a reverse output voltage of greater magnitude than the forward voltage across the high stored charge diode and the switch means is caused on said output.

4,115,764

DIAGNOSTIC SYSTEM EMPLOYING A MAGNETIC FIELD RESPONSIVE APPARATUS

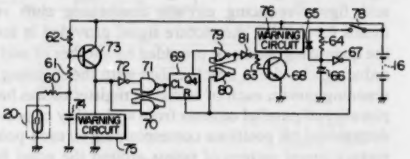
Hiroaki Yamaguchi, Anjo, and Hiroshi Fujinami, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 608,239, Aug. 27, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,773

Claims priority, application Japan, Sep. 27, 1974, 49/111883

Int. Cl.[2] G08B *21/00;* **G01R** *19/00;* **B60Q** *1/00*

U.S. Cl. 340—530 **4 Claims**



1. A current detecting apparatus comprising:

a switch for energizing an electric load through a wire;

a mounting member attachable on said wire;

a reed switch fixedly mounted in said mounting member in such a manner that the longitudinal dimension of said reed switch extends substantially perpendicular to the direction of flow of current in the portion of said wire where said mounting member is attached;

first warning means connected to said reed switch for giving a warning indicative of a sufficient current in said wire, the warning of said first warning means being synchronized with either one of opening and closing operations of said reed switch;

a counter circuit connected to said reed switch, responsive to the closing of said switch, for counting the number of opening and closing operations of said reed switch and generating an alarm signal when a preset count is reached;

second warning means connected to said counter circuit for giving a warning in response to said alarm signal, the warning of said second warning means being maintained irrespective of opening and closing operations of said reed switch; and

a timer circuit connected to said switch and said counter circuit for delaying the initiation of the counting operation of said counter circuit a predetermined period after said wire is energized by the closing of said switch.

4,115,765

AUTONOMOUS DISPLAY PROCESSOR

David Hartke, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1977, Ser. No. 769,597

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **5 Claims**

1. An autonomous display processor adapted for use with a data processing system comprising:

bus means communicating with the data processing system;

a list memory connected to said bus means for storing in a common sequence both data codes and instruction codes;

a font memory adapted to store dot matrix images of text characters at addressable locations therein;

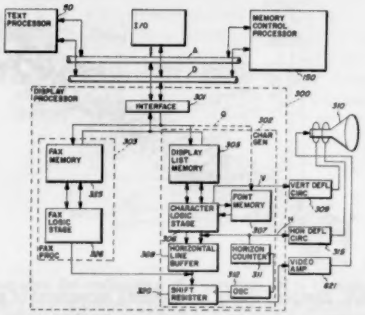
addressing means connected to said font memory and said list memory for selecting particular ones of said text characters matrix images according to said data codes;

arithmetic means connected to said font memory and initiated by said instruction codes in said list memory for sequentially selecting successive rows of a particular one of said text character matrix images;

cycling means connected to said arithmetic and addressing means for selecting a row in the text character matrix image selected by the succeeding data code in said list

memory to be adjacent said particular one of said text character matrix images, said selected row of said adjacent one of said text character matrix images corresponding to the last selected row of said particular one of said text character matrix images;

accumulating means adapted to alternatively store said selected corresponding rows of said text character matrix images and to produce parallel output signals indicative of the combination of said selected rows;



video shifting means connected to cyclically receive said parallel output signals from said accumulating means for producing a stream of binary signals within each alternating cycle of said accumulating means; and

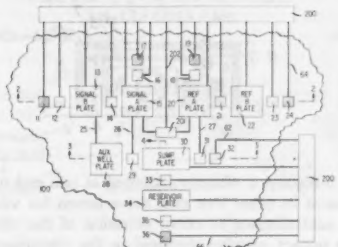
a video tube connected to said video shifting means of said arithmetic means for producing rows of video amplitude corresponding to said stream of binary signals, each row of video amplitude being aligned according to said arithmetic means.

4,115,766

SEMICONDUCTOR APPARATUS FOR ANALOG TO DIGITAL CONVERSION

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1977, Ser. No. 783,342
Int. Cl.[2] H03K *13/09*
U.S. Cl. 340—347 AD **18 Claims**



16. Semiconductor apparatus for analog signal to digital signal conversion comprising:

(a) first and second substantially identical signal well surface regions of a major surface of a semiconductor body, said wells electrically controlled by first and second, respectively, overlying signal electrodes in insulating relationship to said major surface;

(b) first means for introducing into the first well region a first amount of charge in accordance with the analog signal;

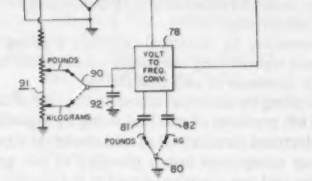
(c) second means for inducing the transfer of a second amount of charge from the first to the second well region through a gate surface region located between said first and second signal well regions, said gate surface region electrically controlled by an overlying gate electrode that has an area of at least two orders of magnitude less than that of the said signal electrode, whereby a third amount of charge, equal to the first less the second amount of charge, remaining in said first well region, corresponds to the analog signal less the most significant bit of said analog signal.

4,115,767

APPARATUS FOR CONVERTING AN ANALOG SIGNAL INTO DIGITAL FORM PARTICULARLY ADAPTED FOR USE IN DIGITAL COUNTER DISPLAYS

Amnon Brosh, Montvale, N.J., and Dana F. Geiger, New York, N.Y., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 631,383, Nov. 12, 1975, Pat. No. 4,041,289.
This application Dec. 1, 1976, Ser. No. 746,240
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 CC **7 Claims**



1. In a system of the type employing an analog transducer biased from a source of operating potential, which undesireably varies to effect the output of said transducers, the combination therewith of apparatus for converting the analog signal into a digital form relatively independent of said variation of said source, comprising:

(a) a voltage to frequency converter having an input responsive to said analog signal to provide at an output thereof, a frequency related to said analog signal, said frequency at said output being undesireably effected by said source variation to therefore contain a component related to said source variation and unrelated to said true value of said analog signal,

(b) counting means coupled to said output and operative to count said frequency upon application of a suitable predetermined duration, gating waveform to said counting means, to thereby provide a count indicative of said frequency and therefore of both said analog signal and said undesireable variation,

(c) a gate generator including a second voltage to frequency converter responsive to said potential source to provide said suitable gating waveform which varies from said predetermined duration according to said undesired potential variation to thereby compensate said gating waveform according to said undesireable variation in said analog signal to enable said counter to correctly count said frequency strictly according to said true value of said analog signal and relatively independent of said variations, and

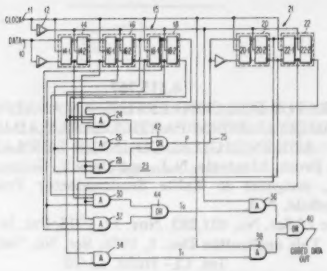
(d) means for applying said gating waveform to said counter.

4,115,768

SEQUENTIAL ENCODING AND DECODING OF VARIABLE WORD LENGTH, FIXED RATE DATA CODES

John S. Eggenberger, Los Altos, and Paul Hodges, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 466,360, May 2, 1974, abandoned. This application Jun. 20, 1977, Ser. No. 807,999
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD 14 Claims



1. A method of decoding by electrical circuitry on a bit sequential basis a first string of run length limited binary bits representing variable length multi-bit code words into a second string of binary bits representing sequential multi-bit data words, said words belonging to a predefined dictionary, where said code words have twice as may bits as said data words, said method comprising:

(1) generating by electrical circuitry a group of electrical signals representing the binary values of the bits in the first eight positions of said first string;

(2) decoding by electrical circuitry the pair of bits in said 5th and 6th positions of said first string by logically combining in electrical circuitry all of said electrical signals from said group except one into a plurality of sub groups so that either said one electrical signal or the electric signal resulting from the sub group combination represents the value of the first bit of said second string one of said subgroups including a signal from said first position and another of said subgroups including a signal from said second position to thereby resolve the ambiguity between two four-bit patterns common to a pair of said code words in said predefined dictionary; and

(3) repeating said first and second steps for the next new combination of eight sequential bit positions (3–10) beginning with the next sequential odd bit position (3) until said first string has been decoded.

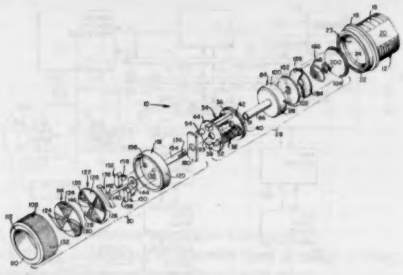
4,115,769

DAMPING MEANS FOR INDICATORS

Robert D. Hart, Collinsville, and Robert Mazzamauro, Waterbury, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Jun. 2, 1977, Ser. No. 802,937
Int. Cl.[2] G08B *5/22*
U.S. Cl. 340—373 9 Claims

1. In a binary indicator for indicating one of a normal condition and a fault or malfunction condition of apparatus being monitored comprising a casing, an indicator assembly received by said casing and including an indicator disc, means mounting said indicator disc for movement about the axis of said casing in opposite rotational directions through less than a full turn between two stable positions, means in said casing responsive to a change of at least momentary duration from said normal condition, means cooperating both with said condition responsive means and mounting means to impart rotational impetus to said indicator disc whereby said indicator disc relocates from one to the other of said stable positions upon occurrence of said change, means for resetting said indicator disc to the former of said stable positions so that said indicator disc may similarly relocate to the latter position upon a subsequent change in condition, said resetting means being carried by said casing and adapted to be rotated from a first limit position, said resetting means including means for imparting rotational impetus to said indicator disc to return to said former position when said resetting means shall have been rotated to a second limit position, means biasing said resetting means toward said first limit



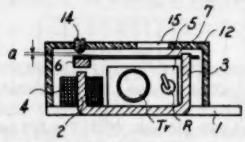
position, damping means for damping movement of said resetting means in return to said first limit position under forces of said biasing means, said damping means including at least a pair of friction discs and a layer of a high shear force material therebetween in surface-to-surface contact with the discs of each pair, and window means for viewing a display definitive of said condition on said indicator disc, said window means being carried by said resetting means and coaxial with said indicator disc.

4,115,770

A BUZZER HAVING ADJUSTABLE BUZZER SOUND

Masayuki Kanazawa, Ishioka, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed May 27, 1976, Ser. No. 690,522
Claims priority, application Japan, Jun. 9, 1975, 50/78618[U]
Int. Cl.[2] G10K *9/12*
U.S. Cl. 340—396 3 Claims



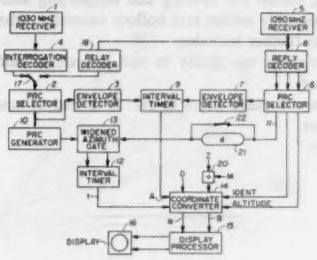
1. In a buzzer: a vibrator mounted at one end to undergo vibration at its other free end; drive means for vibrationally driving said vibrator to effect vibration of the vibrator free end; an impact member disposed in the vibrational path of travel of the vibrator free end so as to be repeatedly struck thereby during vibration of said vibrator to produce a buzzer sound; and means mounting said impact member to enable selective positioning thereof along said path of travel in directions towards and away from said vibrator free end to accordingly selectively vary the buzzer sound, said means mounting said impact member comprising a screw thread on said impact member, and means defining a screw-threaded opening fixedly located relative to said vibrator and having said screw thread adjustably threaded therein so that turning of said impact member effects axial movement thereof and varies the point along said path of travel at which said vibrator free end strikes said impact member to accordingly vary the buzzer sound.

4,115,771

PASSIVE ATCRBS USING SIGNALS OF REMOTE SSR

George B. Litchford, Northport, N.Y., assignor to Litchstreet Co., Northport, N.Y.

Continuation-in-part of Ser. No. 685,312, May 11, 1976, abandoned. This application May 17, 1977, Ser. No. 797,675
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6 R 10 Claims



6. Apparatus for indicating the position of a transponder with respect to a reference position at a known location within the service area of a secondary surveillance radar (SSR), comprising

(a) means for receiving interrogations from said SSR,

(b) means for receiving transponder replies to said interrogations,

(c) means for measuring the interval between reception of a group of interrogations and the reception of a group of transponder replies to determine the differential azimuth A,

(d) means for measuring the differential time of arrival t between an interrogation, or a simulation thereof, and the corresponding reply, and

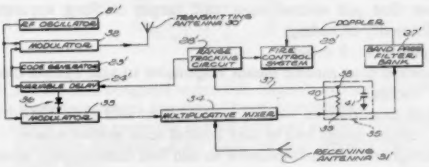
(e) means for computing the position of said transponder from said quantities A and t and the distance D and azimuth Z of said known location from said SSR.

4,115,772

PSEUDO-NOISE RADAR SYSTEM

Sergio F. Valdes, Canyon Country, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 7, 1975, Ser. No. 593,219
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R 3 Claims



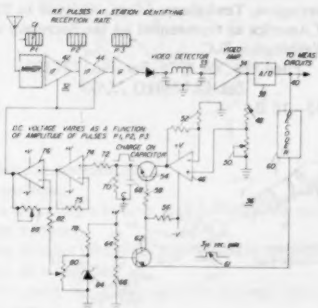
1. A pseudo-noise radar system with effectively zero amplitude cross-correlation function for a phase shift of one bit or more to one bit less than a word, said system comprising: a radio frequency (RF) oscillator having an output and being provided to produce an output signal thereat; first and second modulators each having first and second inputs and an output; a transmitting antenna connected from the output of said first modulator; a multiplicative mixer having first and second inputs, and an output; utilization means connected from the output of said multiplicative mixer; a receiving antenna, the output of said second modulator and said receiving antenna being connected to said first and second multiplicative mixer inputs, respectively, the first inputs of said first and second modulators both being connected from said RF oscillator output; and code generator means having first and second outputs, one of said first and second modulators being a biphase modulator, the other of said first and second modulators being an amplitude modulator, both of said first inputs of said first and second modulators being connected from said RF oscillator output, said code generator means first and second outputs being connected to the second inputs of said one and said other of said modulators, respectively, said code generator means producing a first signal at said first output thereof to said one modulator to produce an output signal at the output thereof which is in phase for one or more equal, but either spaced or successive first time periods T_b with said Rf oscillator output signal, and which is 180° out of phase for one or more equal, but either spaced or successive second time periods T_b, said first and second time periods occurring consecutively, said code generator means producing a second signal at said second output thereof of pulses of widths equal to mT_b and of a constant amplitude where m is any positive integer, said second signal having a zero amplitude between said mT_b pulses, said second signal being formed into a binary pulse code having equal successive word lengths, each successive word having a maximal binary pulse code identical to the next preceding word, said pulses mT_b occurring synchronously with the singular or successive ones of one of said first and second periods.

4,115,773

SYNCHRONIZED PULSE AMPLITUDE CONTROL FOR PULSE MEASURING CIRCUITS

James E. Metcalf, Arlington, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Feb. 2, 1977, Ser. No. 764,717
Int. Cl.[2] G01S 7/34, 9/02
U.S. Cl. 343—7 AG 9 Claims

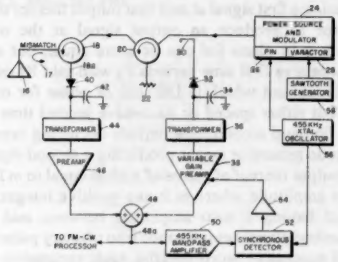

RF PULSES AT STATION IDENTIFYING RECEPTION RATE
VIDEO DETECTOR
VIDEO AMP
TO MEAS. CIRCUITS
A/D
DC VOLTAGE VARIES AS A FUNCTION OF AMPLITUDE OF PULSES P1, P2, P3
CHARGE ON CAPACITOR
PULSE

1. A pulse amplitude control circuit for a radio ranging system wherein received radar pulses continuously recur at a predetermined repetition rate, said circuit comprising means for transmitting radar ranging pulses at said predetermined rate with closely controlled characteristics, receiver means having a controllable gain for receiving and forwarding said radar ranging pulses for data processing, gate means driven at said predetermined rate for feeding back as gate pulses signals derived from said forwarded pulses responsive to received radar pulses whereby said gate means feeds back said gate pulses only if the received radar pulses recur at the predetermined rate, and means responsive to said fedback gate pulses for adjusting said controllable gain for the duration of said gate pulses to provide a standard amplitude amplitude radar pulse responsive to deviations of the received pulse from the controlled characteristic of the transmitted pulse, said standard amplitude pulse being usable by said data processing means.

4,115,774
CW RADAR AM-NOISE VIDEO-CANCELLATION SYSTEM

Carl P. Tresselt, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 17, 1977, Ser. No. 825,311
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—17.7 **13 Claims**



1. In a continuous wave radar system wherein means are provided for generating a continuous wave for transmission by said system and where a resultant radar return signal is received by said system, an improvement comprising:

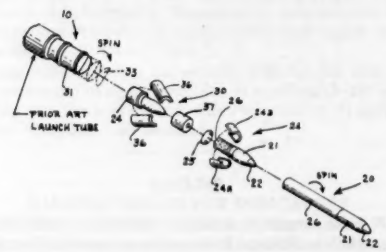
means for introducing predetermined amplitude modulated sidebands to said continuous wave; and,

means for removing the amplitude modulated components in the resultant radar return signal caused by the introduced predetermined amplitude modulated sidebands.

4,115,775
DEEP PENETRATING FOREBODY WITH TETHERED RADAR REFLECTOR

John J. Harrington, Tewksbury, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 29, 1976, Ser. No. 727,103
Int. Cl.[2] H01Q 15/00
U.S. Cl. 343—18 B **10 Claims**



1. An electronic signal reflector, adapted for use as a radar signal reflector, capable of forming a target which is false in size and in configuration, comprising:

a. a payload subassembly which includes:

(1) a cone-shaped, deep penetrating forebody having an orgival nosetip fore and a base aft;

(2) a bellows-folded, expansible, cylinder-like shaped, tethered radar signal reflector bag, with said reflector bag releasably connected to said aft base of said deep penetrating forebody, and with said reflector bag having an open foreward end, a closed aft end, and a length along which are affixed a plurality of circumferential crown reflectors in spaced relationship to each other;

(3) and, a split, hollow, open-ended container, having a removably attached aft cover, for housing said bellows-folded, tethered radar signal reflector bag.

b. a housing subassembly surrounding said payload subassembly, for containing said payload subassembly, which includes:

(1) a hollow cannister having an open fore end with a removably attached cover closing said fore end, and an aft end whereby said fore end is selectively openable;

(2) and, means for holding and supporting said payload subassembly within said hollow cannister, wherein said means further includes:

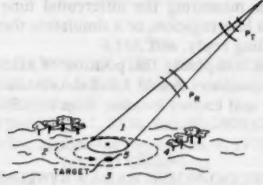
(a) a split sabot essentially at said aft end of said hollow cannister;

(b) and, a one piece sabot at said fore end of said hollow cannister.

4,115,776
ADAPTIVE GAIN CONTROL FOR RADIOMETRIC TARGET TRACKING SYSTEM

Robert S. Roeder, Dunedin, Fla., and Lucien C. Bomar, II, Marietta, Ga., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,956
Int. Cl.[2] G01W 1/00
U.S. Cl. 343—100 ME **11 Claims**



1. High frequency radiometric target tracking apparatus of the kind including conically-scanned gimbal-mounted antenna means, radiometric receiver means responsive to said antenna means, target tracking servo loop means responsive to said radiometric receiver means for positioning said antenna means about first and second axes, said target tracking apparatus additionally including:

system clock means,

conical scan motive means responsive to said system clock means,

first demodulator means responsive to said radiometric receiver means and to said conical scan motive means,

integrator means responsive to said first demodulator means,

servo means responsive to said integrator means for positioning said gimbal-mounted antenna means about at least said first axis,

automatic gain control signal generator means additionally responsive to said first demodulator means,

frequency divider means additionally responsive to said system clock means for producing a first frequency signal,

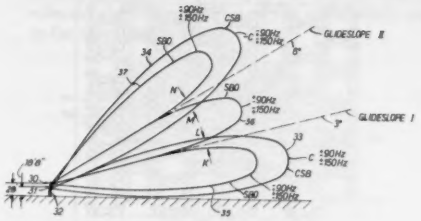
signal amplitude divider means responsive to said frequency divider means and to said automatic gain control means for producing a quotient output, and

first signal adder means in series relation with said integrator means and said servo means and responsive to said signal amplitude divider means for supplying a combined output for control of said servo means.

4,115,777
AIRCRAFT LANDING SYSTEMS

Frank Howard Taylor, London, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,355
Claims priority, application United Kingdom, Oct. 28, 1975, 44398/75
Int. Cl.² G01S 1/18, 1/10
U.S. Cl. 343—108 R **6 Claims**

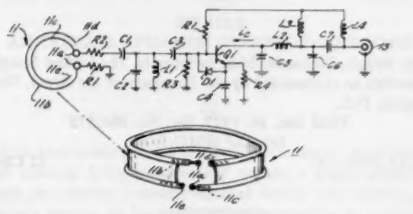


1. An aircraft landing system for aircraft having I.L.S. equipment, including a glide slope antenna system which comprises two antennae mounted on a support structure at respective heights above ground in the ratio of 3:2 and signal generating and distribution means for generating and feeding respective signals to said antennae so that the antennae provide in combination a multi-lobe radiation pattern which produces resultant signals just below and just above slope paths at 3° and 6° angles to the ground for generating in an approaching aircraft "fly-up" and "fly-down" signals, respectively, thereby providing for glide slope approaches by aircraft at said angles.

4,115,778
ELECTRONIC SOLID STATE FM DIPOLE ANTENNA

Robert Eric Snow, Raleigh, N.C., assignor to JFD Electronics Corporation, Oxford, N.C.

Filed Nov. 18, 1976, Ser. No. 742,680
Int. Cl.² H01Q 1/26
U.S. Cl. 343—701 **2 Claims**

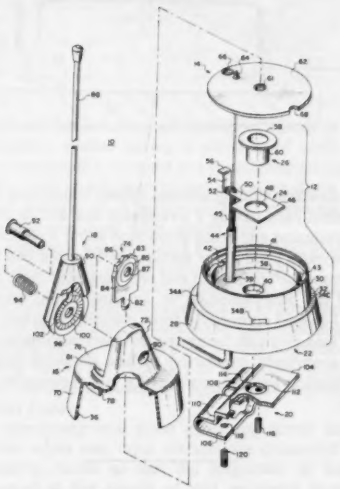


1. An antenna designed to provide omnidirectional reception over a predetermined frequency band comprising:
a single dipole assembly having first and second dipole substantially coplaner arms each having inboard and outboard ends;
a pair of closely spaced feed points for coupling energy from said assembly to associated circuitry, and being connected to said inboard ends;
each of said arms being bent or formed to lie along an imaginary circle of said arms being positioned slightly above the other and so that inboard ends of the arms lie along said imaginary circle and are spaced apart by a distance at least as great as the distance between said feed points; and
solid state amplifier means coupled to said feed points for providing substantially constant gain over said frequency band to signals received from said feed points; and an
AC to DC converter means having an input for coupling said means to a source of AC energy;
a cable coupling;
impedance conversion means coupled between the DC output side of said AC-DC converter means and said second coupling;
a coaxial cable coupled between said amplifier and said cable coupling for transferring DC energy to amplifier means and for transferring amplified signals received by said dipole assembly to said impedance conversion means;
said amplifier including impedance means coupled to said cable for coupling DC energy to said amplifier while blocking high frequency energy especially in said reception band.

4,115,779
AUTOMOBILE TRUNK ANTENNA MOUNT

Danny M. Dantzler, Lincoln, Nebr.; James Bartley Meehan, Waterloo, Iowa; Wayne Fredrick Everman, Cedar Falls, Iowa; Donald E. Fluent, Cedar Falls, Iowa, and Howard George Sachs, Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr.

Filed May 14, 1976, Ser. No. 686,310
Int. Cl.² H01G 1/32
U.S. Cl. 343—715 **14 Claims**



1. An antenna comprising:
an antenna base;
said base including a bottom wall having a top surface and a bottom surface;
mounting bracket means for mounting the antenna base to a surface of a vehicle;
means for receiving a coaxial cable having inner and outer conductors;
means for mounting an antenna mast to said base;
a ground strap;
said ground strap including means for intimately engaging the outer conductor of said coaxial cable;
means for electrically and mechanically connecting said mounting bracket means and ground strap together;
said means for electrically and mechanically connecting said mounting bracket means and ground strap together comprising means for holding said ground strap on the top surface of said bottom wall of said base and for holding said mounting bracket means to said bottom surface of said base bottom wall;
said means for electrically and mechanically connecting including internal walls defining an opening in the bottom wall of said base;
said ground strap being positioned on the top surface of said bottom wall and one surface of said mounting bracket means being positioned on the bottom surface of said wall;
said means for electrically and mechanically connecting

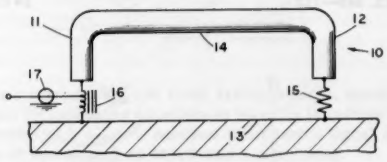
having a first portion passing through said hole, a second portion overlying said ground strap and a third portion positioned underneath said surface of said mounting bracket means, whereby said bottom wall, ground strap and surface of said mounting bracket means are compressed together.

4,115,780

DIRECTION FINDING ANTENNA SYSTEM

David J. Goodman, P.O. Box 18161, Cleveland Heights, Ohio 44118

Filed Jan. 12, 1977, Ser. No. 758,591
Int. Cl.[2] H01Q *1/48, 21/08*
U.S. Cl. 343—739 **5 Claims**



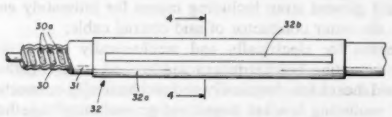
1. A direction finding antenna system comprising a plurality of antennas each having a terminated end and an output end, each terminated end being positioned about a central point on an electrically conductive surface, each output end being outboard from the terminated end and separated from the output ends of the other antennas by an equal angle, each antenna being U-shaped comprising three electrically active elements, two of said elements being spaced-apart monopoles mounted on said electrically conductive surface, the third element being a transmission line, top connecting said monopoles over said surface.

4,115,781

RADIATION ENHANCEMENT DEVICE

David N. Gershberg, Rockville, Md.; Alexander Y. Lee, Arlington, Va., and Michael D. D'Orto, Hyattsville, Md., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jun. 10, 1977, Ser. No. 805,448
Int. Cl.[2] H01Q *3/26*
U.S. Cl. 343—768 **23 Claims**



1. In a radiation enhancement system for a coaxial transmission line having a center conductor and an outer conductor with longitudinally spaced radiation slots, the combination which comprises:

(a) a dielectric tube partially encircling and slidably positionable along the transmission line; and

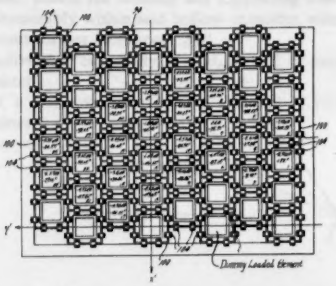
(b) conductive element bonded to the outer surface of said dielectric tube for movement therewith to enhance the orthogonally polarized component of energy coupled from said center conductor through said radiation slots.

4,115,782

MICROWAVE ANTENNA SYSTEM

Ching C. Han, Sunnyvale, and Harry J. Gould, Cupertino, both of Calif., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 21, 1976, Ser. No. 698,254
Int. Cl.[2] H01Q *19/14, 19/12*
U.S. Cl. 343—779 **11 Claims**



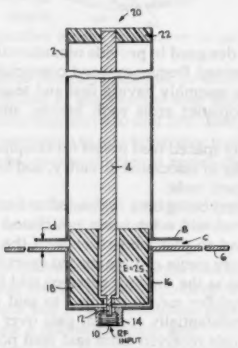
4. A microwave antenna system which comprises: a plurality of waveguide elements, each of said waveguide elements having first and second ports, means for converting a first linearly polarized microwave signal at one of said ports to or from a left-hand circularly polarized microwave signal within said waveguide element and for converting a second linearly polarized signal at the other of said ports to or from a right-hand circularly polarized microwave signal, each of said waveguide elements having an end, separated from said first and second ports by said converting means, said waveguide element end being in communication with free space, thereby, to permit circularly polarized microwave electromagnetic radiation to be transmitted from or received by said waveguide element end, and said waveguide element end having associated with it isolation means for reducing mutual coupling of circularly polarized microwave radiation associated with one of said waveguide elements with such circularly polarized microwave radiation of other of said waveguide elements.

4,115,783

BROADBAND HYBRID MONOPOLE ANTENNA

Frank Reggia, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,575
Int. Cl.[2] H01Q *9/44*
U.S. Cl. 343—792 **12 Claims**



1. A broadband hybrid monopole antenna which comprises:
a metal ground plane;
a metal inner conductor feed network passing through the

ground plane and extending approximately ¼ of the operating wavelength above the plane;

a metal outer conductor whose length is slightly less than ¼ of the operating wavelength, concentric with the inner conductor and capacitively coupled to the ground plane; and

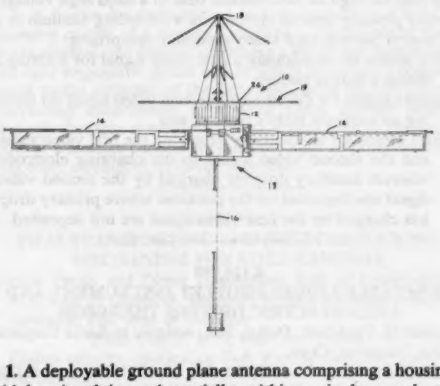
an rf input with one conductor electrically coupled to the input end of the inner conductor for feeding electromagnetic energy into the inner conductor and the second conductor electrically coupled to the ground plane, wherein electromagnetic energy is capacitively coupled to the outer conductor.

4,115,784

DEPLOYABLE GROUND PLANE ANTENNA

Lee Schwerdtfeger, Silver Spring; Lee E. Stillman, Wheaton, and William E. Frain, Ellicott City, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1977, Ser. No. 765,719
Int. Cl.² H01Q *15/20*
U.S. Cl. 343—915 7 Claims



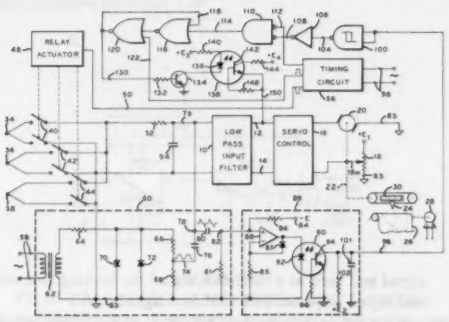
1. A deployable ground plane antenna comprising a housing, said housing lying substantially within a single preselected plane, an antenna centrally located within said housing, said antenna having its longitudinal axis extending in a direction perpendicular to said preselected plane of said housing, a ground plane, said ground plane being made of collapsible material, means pivotally connected to said housing for supporting said ground plane in either a deployed condition radially extending from said housing or in a collapsed condition wrapped around said housing, said supporting means lying during said deployed conditions as well as said collapsed position substantially within said preselected plane of said housing, means operably connected to said supporting means for moving said supporting means and said ground plane between said collapsed position located adjacent to the periphery of said housing and wrapped therearound while lying substantially in said preselected plane of said housing and a deployed position extending radially beyond said housing while lying substantially within said preselected plane of said housing and means for maintaining said ground plane in the collapsed position whereby upon said release of said ground plane maintaining means said ground plane extends to said deployed position.

4,115,785

OPEN CIRCUIT DETECTOR FOR MULTIPOINT RECORDER

Howard Sherman Hoopes, Hatfield; Robert William McClenahan, Philadelphia; Thomas Joseph Walsh, Hatboro, and James William Zecca, Telford, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Aug. 12, 1977, Ser. No. 824,150
Int. Cl.² G01D *9/34*
U.S. Cl. 346—34 4 Claims



1. Apparatus for detecting an open input circuit in a multipoint recording system having a plurality of input circuits which are sequentially switched in a predetermined time phase relationship with an a.c. power source to sequentially connect said input circuits to a servo-operated measuring circuit through a low-pass input filter, comprising:

a pulse generator for generating a train of short pulses at the frequency of said power source including,

means for connecting said generator to said a.c. power source so that said pulses are phased to occur only when one of said inputs is connected to said measuring circuit,

a clipping circuit for providing limited amplitude square wave having the frequency of said power source, and

means for differentiating said square wave to produce said short pulses;

means connecting said pulse generator across said input circuits when said input circuits are connected to said measuring circuit so that the magnitude of the pulses generated at the output of said generator increases in response to an increased impedance across the generator output when the connected input circuit is open circuited; and

a pulse magnitude detecting circuit connected to said pulse source, said detecting circuit being operative to produce an output signal when detecting said increase in said pulse magnitude indicative of an open circuit in the input circuit connected to the measuring system.

4,115,786

CONSTANT WAVELENGTH MAGNETIC RECORDING

Thomas M. Frey, Brighton, and Stephen F. Pond, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,284
Int. Cl.² G03G *19/00*; G11B *21/02*
U.S. Cl. 346—74.1 7 Claims

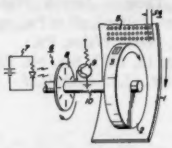
1. Variable speed, constant wavelength magnetic imaging apparatus, comprising:

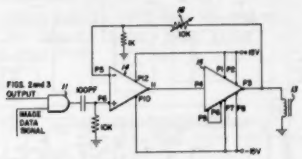
(a) a rotational recording member having a record head mounted thereon;

(b) means for generating a first signal at a frequency lower than the desired recording frequency and directly proportional to the rotational speed of said recording member;

(c) means for generating a second signal at the desired recording frequency which is a multiple of the frequency of said first signal;

(d) means for maintaining said second signal in phase with said first signal by generating a third signal which is substantially locked in phase and frequency with said first





signal and used as a reference signal for locking said second signal in phase with said first signal; and

(e) means for driving said record head at the frequency of said second signal.

4,115,787

INTERPOLATION IN AN INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Masahiko Aiba, Nara; Yoichi Yamamoto, Nara, and Tomoo Makita, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Aug. 14, 1975, Ser. No. 604,798

Claims priority, application Japan, Aug. 16, 1974, 49-94341

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **6 Claims**

1. In an ink jet system printer of the charge amplitude controlling type which emits a stream of ink droplets of a uniform size from a nozzle toward a recording medium, selectively charges said ink droplets at a desired amplitude in accordance with a print information signal, deflects said charged ink droplets by deflection means, and prints desired symbols on said recording medium in a dot matrix pattern with said deflected ink droplets, said deflected ink droplets charged in accordance with said print information signal comprising primary matrix dots, the improvement comprising:

interpolation means for depositing interpolation ink droplets between adjacent primary matrix dots on the recording medium, said interpolation ink droplets having a same size as said deflected ink droplets comprising said primary matrix dots.

4,115,788

COMPOUND MATRIX FORMATION IN AN INK JET SYSTEM PRINTER

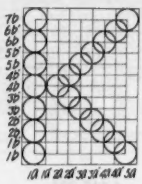
Rikuo Takano, Musashino; Mitsushi Matsunaga, Tokorozawa; Yuhkichi Tsuchida, Akishima; Yuji Sumitomo, Nara; Ikuo Umeda, Kitakatsuragi, and Masahiko Aiba, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed May 6, 1976, Ser. No. 683,964

Claims priority, application Japan, May 8, 1975, 50-55696

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. An ink jet system printer of the charge amplitude controlling type wherein an ink stream emitted from a nozzle having an ultrasonic vibrator is broken into ink droplets of a uniform size at a given vibration frequency, and the individual ink droplets, charged by a charging electrode in accordance with a video signal generated from a video generator, are deflected in accordance with the amplitude of charges carried thereon as they pass through an electrostatic field of a fixed high voltage, thereby printing desired symbols on a recording medium in a dot matrix pattern, said video generator comprising:

first means for developing a first video signal for forming a primary matrix pattern;

second means for developing a second video signal for forming an auxiliary matrix pattern; and

third means for alternatively supplying the first video signal and the second video signal to the charging electrode, wherein auxiliary droplets charged by the second video signal are deposited on the positions where primary droplets charged by the first video signal are not deposited.

4,115,789

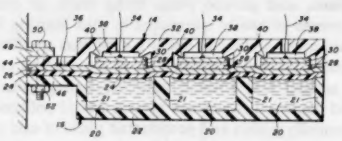
SEPARABLE LIQUID DROPLET INSTRUMENT AND PIEZOELECTRIC DRIVERS THEREFOR

Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 649,381, Jan. 15, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,664

Int. Cl.[2] G01D *15/18*; H01L *41/10*

U.S. Cl. 346—140 R **11 Claims**



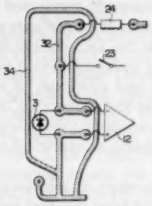
1. In a liquid drop generator comprising: a housing having a plurality of pressure chambers therein, said pressure chambers opening onto an outer surface of said housing; elastic diaphragm means sealing each chamber opening thereby forming an outer wall of a respective chamber; driver unit means releasably secured to said housing, said driver unit means comprising a carrier member and a plurality of transducer means operatively secured to said carrier member; said transducer means comprising a plurality of piezoelectric members and elastic

means operatively secured to each said piezoelectric member for deforming therewith, the portion of said transducer elastic means corresponding to each said piezoelectric members operatively engaging said diaphragm means of a respective one of said chambers in such a manner to normally exert a stress on said diaphragm means tending to decrease the volume of a respective said chamber; and means for applying a voltage across said piezoelectric members to deform the same and thereby their respective said transducer elastic means and diaphragm means for decreasing the volume of their respective said chambers.

4,115,790
DEVICE FOR PREVENTING LEAKAGE CURRENT IN LIGHT RESPONSIVE CIRCUIT

Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,583
Claims priority, application Japan, Jun. 7, 1976, 51/73844[U]
Int. Cl.² G03B *7/00*
U.S. Cl. 354—60 R **5 Claims**

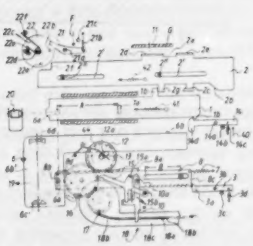


1. A device for preventing a leakage current in a light responsive circuit of a camera including a photoelectric transducer element, the device comprising a shield line surrounding the light responsive circuit and to which is applied a potential equal to the potential of the light responsive circuit, thereby preventing disturbances to a weak signal current flowing through the light responsive circuit which may be caused by flow of a leakage current between the light responsive circuit and other circuits of different potentials.

4,115,791
FILM-TRANSPORTING AND SHUTTER-COCKING MECHANISM FOR STILL CAMERAS

Günter Fauth, and Dieter Engelsmann, both of Unterhaching, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 794,934
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621437
Int. Cl.² G03B *17/42, 13/02*
U.S. Cl. 354—206 **15 Claims**

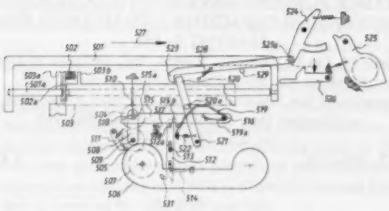


1. In a photographic apparatus for use with film which is collected by a rotary take-up member during forward transport to place successive film frames into exposure position, a combination comprising input means movable in a first direction from an operative position to a rest position; shutter means including a shutter element movable in an opposite second direction from a cocked position to a released position; motion-transmitting means for moving said shutter means to said cocked position in response to movement of said input means to said rest position thereof; and transmission means receiving motion from said input means and including a slide member mounted for movement with said input means and a gear mounted on said slide member to rotate the take-up member during movement of said input means from said rest position to said operative position.

4,115,792
FILM TRANSPORT MECHANISM FOR CAMERAS

Dieter Engelsmann, Unterhaching; Hubert Hackenberg, and Siegfried Zobel, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 823,000
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636617
Int. Cl.² G03B *1/16*
U.S. Cl. 354—213 **13 Claims**

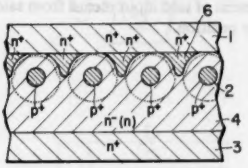


1. In a photographic roll-film camera, a film-transport arrangement comprising, in combination, means defining a path of travel for film within the camera; an input component mounted for movement by the user of the camera to supply film-transport force; a rotary transmission mechanically coupled to the input component for transmitting film-transport force from the input component to film in the camera, the transmission including first and second output components; and arresting means operative for causing the first output component to be arrested and the second output component non-arrested and for then causing the second output component to be arrested and the first output component non-arrested, the arresting means comprising locking means displaceable between a locking position arresting the first output component and an unlocking position releasing the first output component, and sensing means operative in response to film frame advancement for entering into a film perforation, causing the locking means to move to the unlocking position and causing the second output component to become arrested by the resistance of the film to transport, the transmission including a gear driven by the input component and driving the second output component and a rocker mounting the gear for both rotation and swinging movement, the rocker constituting the first output component of the transmission.

4,115,793
FIELD EFFECT TRANSISTOR WITH REDUCED SERIES RESISTANCE

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Nov. 29, 1977, Ser. No. 855,617
Claims priority, application Japan, Nov. 30, 1976, 51/143698
Int. Cl.[2] H01L 29/78, 29/80
U.S. Cl. 357—22 13 Claims

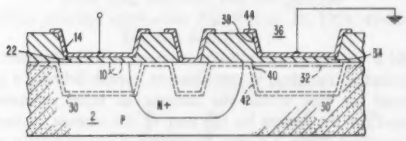


1. A field effect transistor comprising:
a semiconductor region of one conductivity type;
a highly doped source region of said one conductivity type disposed adjacent to said semiconductor region;
a gate structure disposed adjacent to said semiconductor region to define at least one channel in said semiconductor region by depletion layer extending therefrom;
at least one highly doped drain region of said one conductivity type disposed adjacent to said semiconductor region; and
an additional highly doped source region disposed adjacent to said source region in said semiconductor region and extending toward the channel with a converging envelope conforming to the envelope of the depletion layer.

4,115,794
CHARGE PUMPING DEVICE WITH INTEGRATED REGULATING CAPACITOR AND METHOD FOR MAKING SAME

Francisco H. De La Moneda, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 613,781, Sep. 16, 1975, abandoned. This application Dec. 16, 1977, Ser. No. 861.311
Int. Cl.[2] H01L 29/78
U.S. Cl. 357—23 1 Claim

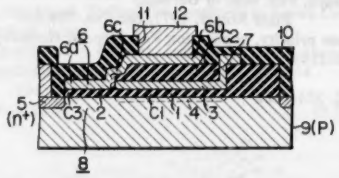


1. A charge pumping device, comprising:
a semiconductor substrate of a first conductivity type;
a first region in the surface of said substrate of a second conductivity type, biased with respect to said substrate;
an insulating layer deposited on the surface of said substrate, having a relatively thin portion located over the semiconductor substrate and overlapping at least one of the edges of said first region defining a gate region;
a gate electrode located over said thin portion of the insulating layer and overlapping said first region, connected to a source of periodic voltage pulses having a first state and a second state with respect to a reference potential;
a voltage source connected between said first region and said reference potential and of such value and polarity to reverse bias the p-n junction formed by said first region except during said first state of the voltage source applied to the gate;
said first state of the voltage pulse driving said substrate underlying said gate into deep depletion of charge carriers of said first conductivity type and said second state voltage pulse driving said substrate underlying said gate into a first magnitude of accumulation of said charge carriers of said first conductivity type;
a second region in the surface of said substrate, adjacent to said first region and beneath said gate, having said first conductivity type of a magnitude greater than that of said substrate and a correspondingly higher threshold voltage;
said substrate having concentration of said first conductivity type dopant of approximately 7×10^{15} atoms per cubic centimeter and said second region has a concentration of said first conductivity type dopant of approximately 10^{17} atoms per cubic centimeter;
said second state voltage pulse driving said second region beneath said gate into a second magnitude of accumulation of said charge carriers of said first conductivity type, greater than said first magnitude;
a second gate electrode over said substrate and separated by said insulating layer;
a third region of said first conductivity type in the surface of said substrate beneath said second gate electrode;
said second gate electrode connected to ground potential;
said third region and said second gate serving as a regulating capacitor so that the DC voltage level produced in said substrate by said pumping device will be regulated;
a blanket layer in said substrate, of said first conductivity type which serves to distribute DC voltage level stored by said regulating capacitor throughout said substrate;
said blanket layer being an electrical contact with said third region;
whereby charge carriers of said second conductivity type which are injected from said first region into said substrate beneath the gate in response to the application of said voltage to said gate electrode will be prevented from rediffusing into said first region by the greater accumulation of said second region when said second state voltage is applied to said gate.

4,115,795
SEMICONDUCTOR MEMORY DEVICE

Fujio Masuoka, and Hisakazu Iizuka, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,693
Claims priority, application Japan, Dec. 26, 1975, 50/154769
Int. Cl.[2] H01L 27/10
U.S. Cl. 357—24 8 Claims



1. A semiconductor memory device comprising:
a semiconductor substrate of a first conductivity type;
a capacitive memory element including a first insulating layer formed on a part of the surface of said substrate and a first electrode formed on said insulating layer, said first electrode serving as one capacitor electrode and said substrate serving as another capacitor electrode of said capacitive memory element;
a semiconductor region of a second conductivity type formed in said substrate spaced from a surface region of said substrate facing said first electrode and said semiconductor region connected to a first external conductor;
a second insulating layer provided on the surface of said

substrate between the semiconductor region of said second conductivity type and said surface region of said substrate;

a third insulating layer provided on said first electrode;

a second electrode including first, second, and third portions, said first and second portions being connected to said third portion and said first portion being disposed on said second insulating layer and said second portion being disposed on said third insulating layer; and

an electrode contacted with said second portion of said second electrode over said surface region of said substrate and connected to a second external conductor.

4,115,796

COMPLEMENTARY-MOS INTEGRATED SEMICONDUCTOR DEVICE

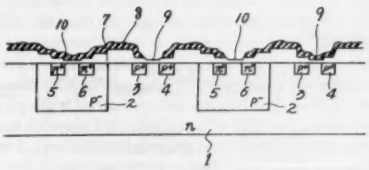
Takeo Fujimoto, Toyonaka; Yasuo Torimaru, Nara; Shin-ichi Ogawa, Suita, and Shinya Yasue, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 592,936, Jul. 3, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,715

Claims priority, application Japan, Jul. 5, 1974, 49-81920

Int. Cl.[2] H01L *27/04*

U.S. Cl. 357—42 **2 Claims**



1. In a complementary integrated semiconductor device including a substrate of a first conductivity type, well-regions of a second conductivity type, a first pair of channels of the second conductivity type formed on the substrate, and a second pair of channels of the first conductivity type formed on the well-regions, the improvement comprising:

ion implanted gate regions in a selected one of said first pair of channels formed on the substrate and in a selected one of said second pair of channels formed on said well-regions, the ion implanted gate region in said first pair of channels having a first threshold level and the ion implanted gate region in said second pair of channels having a second threshold level different from said first threshold level;

non-ion implanted gate regions in the remaining channels of said pairs formed on the substrate and well-regions, the non-ion implanted gate region in said first pair of channels having said second threshold level and the non-ion implanted gate region in said second pair of channels having said first threshold level;

a first pair of complementary MOS transistors including the channel on the substrate in which the gate region is ion implanted and the channel on the well-region in which the gate region is not ion implanted; and

a second pair of complementary MOS transistors including the channel on the substrate in which the gate region is not ion implanted and the channel on the well-region in which the gate is ion implanted.

4,115,797

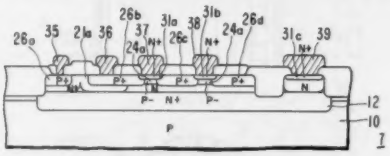
INTEGRATED INJECTION LOGIC WITH HEAVILY DOPED INJECTOR BASE SELF-ALIGNED WITH INJECTOR EMITTER AND COLLECTOR

Hemraj K. Hingarh, Santa Clara, and Richard E. Crippen, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 4, 1976, Ser. No. 729,045

Int. Cl.[2] H01L *21/22, 27/04, 21/82*

U.S. Cl. 357—46 **12 Claims**



1. An integrated injection logic circuit having improved current characteristics comprising:

a semiconductor material having at least one substantially flat surface,

a lateral transistor having an emitter of first conductivity type formed in a first portion of said semiconductor material adjacent said at least one surface, a base of opposite conductivity type to the emitter formed in a second portion of said semiconductor material adjacent said at least one surface, a collector of first conductivity type formed in a third portion of said semiconductor material adjacent said at least one surface, said second portion being laterally disposed between the first portion and the third portion, said second portion being formed by the diffusion of opposite conductivity type impurity into a first region of the surface and into a second region of the surface, the first and second regions being non-contiguous;

a vertical transistor having a second collector of opposite conductivity type to the collector of the lateral transistor defined by a fourth portion of said semiconductor material adjacent said at least one surface, a second base of first conductivity type defined by a fifth portion of said semiconductor material underlying said fourth portion, and a second emitter of opposite conductivity type to the second base defined by a sixth portion of said semiconductor material underlying said fifth portion and spaced from said fourth portion by said fifth portion;

said collector of said lateral transistor being formed subsequent to formation of said lateral transistor base and providing a low resistance current path to said base of said vertical transistor;

means for electrically contacting said first emitter, first base and first collector; and

means for electrically contacting said second emitter, said second base and said second collector.

4,115,798

SEMICONDUCTOR COMPONENT HAVING PATTERNED RECOMBINATION CENTER MEANS WITH DIFFERENT MEAN VALUE OF RECOMBINATION CENTERS ON ANODE SIDE FROM THAT ON CATHODE SIDE

Karl Platzoeder, Haimhausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 2, 1977, Ser. No. 802,816

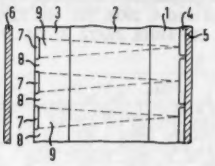
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625856

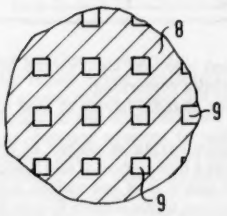
Int. Cl.[2] H01L *29/167*

U.S. Cl. 357—64 **8 Claims**

1. A semiconductor component comprising a semiconductor body having at least two zones of alternate opposite conductivity type, the outer anode-side zone being connected on its entire surface with an anode electrode, said semiconductor

body having recombination centers therein with means for gettering the recombination centers on the outer, cathode-side zone, where at the anode-side and at the cathode-side a drop occurs in the concentration of the recombination centers toward a central region, at least the outer, anode-side region of





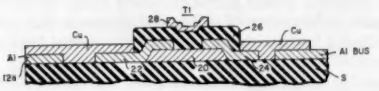
the said central region being divided into surface elements having different levels of concentration of recombination centers, and the ratio of the surface elements being such that in the central region the anode-side mean value of the concentration of the recombination centers is higher than the cathode-side mean value.

4,115,799

THIN FILM COPPER TRANSITION BETWEEN ALUMINUM AND INDIUM COPPER FILMS

Fang-Chen Luo, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,546
Int. Cl.[2] H01L *29/46, 29/54*
U.S. Cl. 357—71 **5 Claims**



1. In a thin film transistor matrix array in which X-Y aluminum buses electrically interconnect thin film transistor circuit arrays in which the source and drain contacts of the thin film transistors comprise a layer of indium contacting the semiconductive material and a layer of copper atop the indium forming indium-copper source and drain contacts the improvement comprising thin film copper transition areas between the aluminum buses and the indium-copper source and drain contacts.

4,115,800

COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

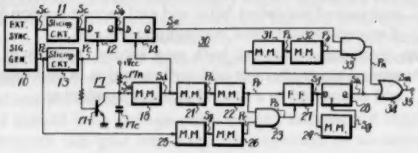
Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 777,551, Mar. 14, 1977, abandoned. This application Oct. 13, 1977, Ser. No. 841,982
Int. Cl.[2] H04N *5/78*
U.S. Cl. 358—8 **7 Claims**

1. Recording apparatus for color video signal including field and line frequency synchronizing signals and a color subcarrier signal, said apparatus comprising:

means for generating a first signal having a frequency commensurate with the field frequency of said color video signal;

means for generating a second signal indicating a field interval in which there is a predetermined phase relationship between the line synchronizing signals and the color subcarrier signal;



means for combining said second signal with said first signal to produce a composite control signal; and

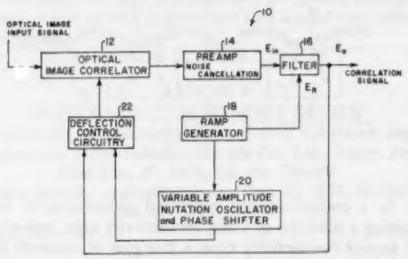
means for recording said composite control signal on a recording medium.

4,115,801

OPTICAL IMAGE CORRELATOR TRACKING FILTER CIRCUIT

Richard A. Salmen, Youngstown, and Clark G. Reed, Greentown, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 3, 1977, Ser. No. 773,998
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—93 **6 Claims**



1. An optical image correlator circuit, comprising:

an optical image correlator receiving an optical image input signal, converting said input signal to an electron stream and nutating said stream as it approaches a storage grid upon which a reference image is maintained as a distributed charge, said correlator producing an output signal indicative of the correlation between the input signal and the reference image;

deflection coils interposed within said correlator for nutating said electron stream;

a deflection coil control circuit means interconnected with and controlling said deflection coils for linearly regulating the rate of nutation of said electron stream, said deflection coil control circuit means including a ramp generator; and

a filter circuit interconnected between said correlator and said deflection coil control circuit for receiving and filtering the output signal of the correlator, said filter circuit having a characteristic frequency response which linearly varies with, and is under control of, an output of said deflection coil control circuit and includes a first multiplier circuit receiving an output from said ramp generator, a first integrator connected to and receiving an output from said multiplier, and a summing point amplifier connected to said first integrator and said correlator and receiving output signals therefrom.

4,115,802
OPTICAL-ELECTRONIC MICROSCOPY APPARATUS AND PROCESS

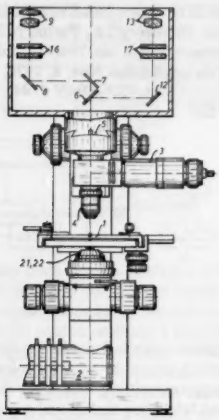
Klaus Kramer, Giessen; Toni Dietrich, Wetzlar, and Peter Braun, Krofdorf-Gleiberg, all of Germany, assignors to Wilhelm Will KG, Nauborn, Germany

Filed Aug. 8, 1975, Ser. No. 603,238

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1974, 2437984

Int. Cl.[2] H04M 7/00

U.S. Cl. 358—93 **24 Claims**



1. A process for increasing the magnification of an optical electronic microscope together with increasing the resolving power to observe dynamic phenomena in living specimens which are not visible through light optical means due to insufficient optical resolving power, comprising the steps of producing by light optical means on two iconoscopes two real images of different light qualities of a specimen, scanning point by point in synchronism the two real images on the two iconoscopes and amplifying electronically both of the scanned real images, and forming by logarithmic difference a single visible image from the two amplified real images such that separate cell structures are visible in the image.

4,115,803
IMAGE ANALYSIS MEASUREMENT APPARATUS AND METHODS

Roger R. A. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,439

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—107 **16 Claims**

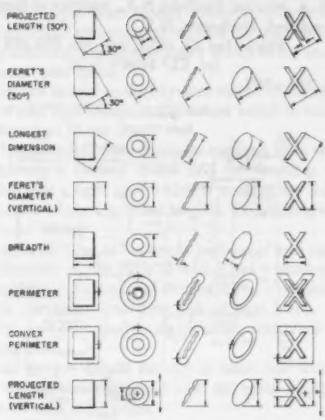
1. An image analysis system for measuring an image in a field of view as a function of the relationship of assigned values or points on lines of scan such that points of equal value on separate lines of scan lie in a straight line oriented at a predetermined angle with respect to the lines of scan traversing the field of view, comprising:

means for scanning the image within the field of view to generate a video signal;

means for generating boundary signals as a function of the video signal to define the boundaries of the image;

electronic means for producing a count value in synchronism with the scanning means such that all location points of the scanning spot on each scan line at a specific count value of the electronic means, align at a predetermined angle to the scan lines; and

processing means for measuring the image as a function of the count value of the electronic means related to the time



of occurrence of the boundary of the image as defined by the boundary signal.

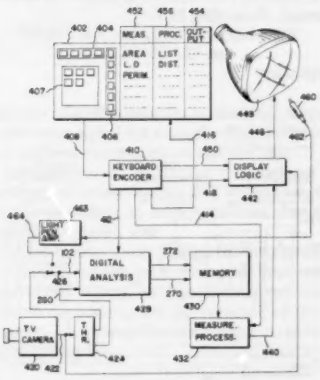
4,115,804
IMAGE ANALYSIS DATA EXTRACTION

Roger R. A. Morton, Penfield, and Cornelius J. D. McCarthy, Fairport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,392

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—107 **13 Claims**



5. An image analysis system for producing a video signal from images of objects in a field of view by scanning across the field of view, comprising:

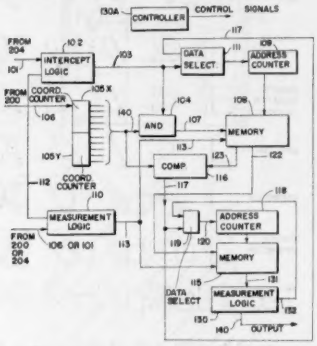
means for generating measurement data of individual objects during a single field of scan as a function of the video signal; and

means for displaying the measurement data of individual objects together with the image of the field of view as a function of the video signal on the same display.

4,115,805
IMAGE ANALYSIS INDEXING APPARATUS AND METHODS

Roger R. A. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,393
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—107 7 Claims



5. An image analysis system performing compound measurements derived from two or more measurements extracted from different fields of scan on each of a number of objects within a field of scan, comprising:

means for performing, during a first field of scan, measurements on individual objects within the field of scan;

means for performing on a second field of scan a different measurement on the objects within the field of scan;

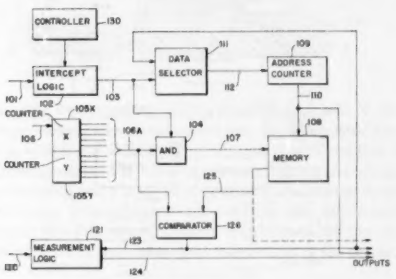
storage means for storing the measurements from each of the field of scans; and

measurement processing means for processing for each object the measurements from each of the field of scans to form a compound meaurement.

4,115,806
IMAGE ANALYSIS DATA TRANSFER

Roger R. A. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,438
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—107 10 Claims



1. An image analysis system for processing data extracted from an image across a field of view using repeated scans of the image, comprising:

means for producing a video signal as a function of the image;

means for producing a binary signal as a function of the video signal;

means for extracting data from the binary signal to define a position of a point within the field of view;

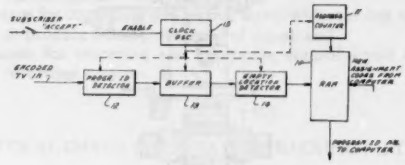
means for storing the data defining the point; and

means employing the stored data during a subsequent scan of the image for identifying data generated as a function of the video signal during the occurrence of the subsequent scan, at the defined point by comparing the data defining the position of the point within the field of view with the position of the scan at which the video signal is used to generate further data.

4,115,807
TELEPHONE BILLING APPARATUS FOR A SUBSCRIPTION TELEVISION SYSTEM

H. George Pires, 20 Surrey La., Parlin, N.J. 08859

Continuation-in-part of Ser. No. 706,929, Jul. 19, 1976, Pat. No. 4,068,264. This application Nov. 1, 1976, Ser. No. 737,856
Int. Cl.[2] H04N 1/44
U.S. Cl. 358—122 14 Claims

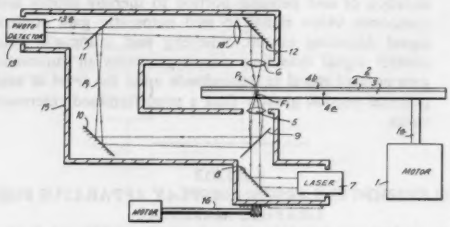


1. In a television system furnishing television programs to subscribers having access to a communications network and having encoding-transmitting means for furnishing and transmitting encoded television signals and a plurality of receiving-decoding means, each for receiving said encoded television signals and furnishing corresponding decoded television signals only when activated by a subscriber-furnished program acceptance signal: a billing system, comprising, in combination, storage means in each of said receiving-decoding means, for storing a customer identification number and a plurality of program identification numbers, each indicative of the charge for a subscriber-accepted television program; central computing means connected to said communications network for computing the charge to each of said subscribers for so-accepted programs in response to billing signals applied thereto; a plurality of read-out means, each intercoupled between one of said storage means and said communications network and responsive to an initiation signal, for reading out said customer identification number and said program identification numbers, furnishing corresponding respective customer identification signals and billing signals, and applying said signals to said communications network for transmission to said central computing means; and means for furnishing said initiation signal under subscriber control; wherein said means for furnishing said initiation signal comprises means for furnishing said initiation signal under subscriber control; wherein said encoding-transmitting means comprises means for encoding television signals for each of said television programs in accordance with a selected one of a set of predetermined codes, and means for periodically changing said set of predetermined codes; wherein said receiving-decoding means comprises decoder logic circuit means operable in a selected one of a plurality of decoder modes corresponding in number to said set of predetermined codes in accordance with program code signals applied thereto; wherein said storage means comprises a random access memory having a first set of storage locations for storing said program identification numbers, a second set of storage locations for storing said customer identification number, and a third set of storage locations for storing program code numbers corresponding to said program code signals; and wherein said central computing means comprises means for furnishing updated ones of said program code signals corresponding to a changed set of said predetermined codes to said random access memory only following receipt of said billing signals by said central computing means.

4,115,808
OPTICAL SIGNAL PLAY-BACK DEVICE WITH AUTO-FOCUSSING OF A LIGHT BEAM AT A RECORD CARRIER SURFACE

Senri Miyaoka, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,368
Claims priority, application Japan, Mar. 11, 1976, 51-26310
Int. Cl.² H04N *5/84, 5/76*; G11B *7/12*
U.S. Cl. 358—127 **12 Claims**

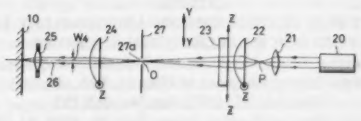


1. In a signal play-back device having a substantially flat record carrier with first and second oppositely facing reflective surfaces and a signal recorded as variations in at least said second surface, a light source emitting a light beam for scanning the recorded signal variations and providing correspondingly varied reflected beam energy, and light detecting means having a surface for receiving said varied reflected beam energy and providing a corresponding output; an optical system comprising first lens means directing said light beam from said source against said surface for reflection by the latter and focussing the light beam reflected from said first surface at an image point remote from said first surface, second lens means for effecting a predetermined focussing of said image point of the light beam onto said second surface and directing the light beam reflected from said second surface toward said surface of the light detecting means, the magnification factors of said first and second lens means being proportioned relative to each other for maintaining said predetermined focussing of said image point at said second surface irrespective of variations in the distance of said second surface from said second lens means, and third lens means interposed in the path of the light beam between said second lens means and said light detecting means and being dimensioned and positioned to focus, at the plane of said surface of the light detecting means, a plane which is spaced from said second lens means toward said third lens means by a distance equal to the focal length of said second lens means.

4,115,809
LASER BEAM SYSTEM FOR OPTICALLY RECORDING INFORMATION SIGNALS ON A RECORD DISC

Ichiro Ueno, Isehara, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 29, 1976, Ser. No. 745,685
Claims priority, application Japan, Nov. 29, 1975, 50-142758
Int. Cl.² H04N *5/76*
U.S. Cl. 358—128 **3 Claims**



1. A system for optically recording on a record disc, comprising:

light source means for emitting a light modulated in conformance with an information signal to be recorded;

optical system means for converting said light from the light source into a light beam having a relatively large width in the longitudinal direction of a track formed on said recording disc and a relatively small width in the transverse direction of said track;

slit plate means in said optical system means for limiting the width of said light beam to a constant width in said transverse direction of the track; and

focusing lens means for receiving as incident light said light beam having a limited width and for forming on said recording disc a light spot which is small in the longitudinal direction of the track and large in the transverse direction of said track;

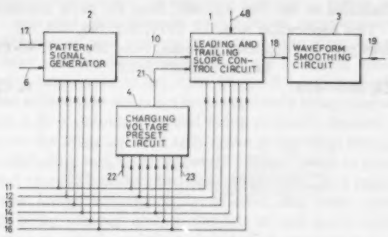
said light spot forming in the upper surface of said recording disc a plurality of pits each of which has a small width in the longitudinal direction of the track and a constant large width in the transverse direction of said track, thereby recording said information signal along said track on said recording disc,

said optical system means having at least one focal point within the optical path, and said slit plate being at the position of said focal point.

4,115,810
TELEVISION SIGNAL GENERATOR

Tsuneo Mikado, Hachioji, Japan, assignor to Nippon Television Industry Corporation, Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,395
Claims priority, application Japan, Jun. 25, 1976, 51-75879; Oct. 28, 1975, 50-130215
Int. Cl.² H04N *5/30*; H03K *4/00*
U.S. Cl. 358—139 **9 Claims**


PATTERN SIGNAL GENERATOR
LEADING AND TRAILING SLOPE CONTROL CIRCUIT
WAVEFORM SMOOTHING CIRCUIT
CHARGING VOLTAGE PRESET CIRCUIT

1. A television signal generator, comprising: means for generating a television signal for reproducing on a television picture tube a required pattern, shape and the like;

a time constant circuit to change the rise and fall times respectively at every leading and trailing edge of waveforms corresponding to each horizontal scanning line of said television signal; and

control means to selectively change the time constant of said time constant circuit such that said time constant has predetermined values, said predetermined values being selected in dependence on the variation of the outline of said pattern, shape and the like relative to each said horizontal scanning line.

4,115,811
DATA SLICING APPARATUS AND METHOD

Raymond Charles Goff, Farnborough, England, assignor to Aston Electronic Developments Ltd., England

Filed Dec. 6, 1976, Ser. No. 748,232
Claims priority, application United Kingdom, Dec. 9, 1975, 50366/75; Feb. 12, 1976, 5584/76
Int. Cl.² H04N *5/21*
U.S. Cl. 358—167 **10 Claims**

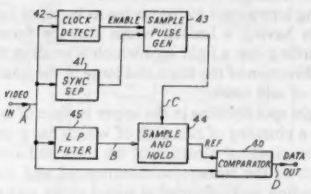
1. A data slicer for use with a data signal comprising a burst

of clock pulses followed by a sequence of data pulses comprising:

(a) detector means connected to a signal input for detecting the presence of clock pulses on an incoming signal;

(b) generator means connected to said detector means for generating a sampling pulse during the time that the presence of the clock pulses is detected;

(c) averaging means connected to said signal input for establishing the mean level of the incoming clock pulses;



(d) sampler means connected to said averaging means for sampling the mean incoming signal level when established by said averaging means during the sampling pulse interval and for storing the sampled signal;

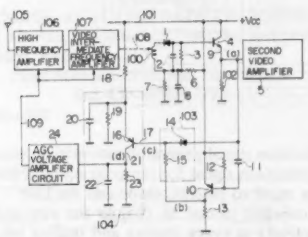
(e) comparator means having a first input connected to said signal input and a second input connected to the sampler means for receiving and comparing said incoming signal with the sampled signal stored in said sampler means to effect slicing of said data pulses from the incoming signal.

4,115,812

AUTOMATIC GAIN CONTROL CIRCUIT

Mitsuharu Akatsu, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 526,406, Nov. 22, 1974, abandoned.
This application Aug. 15, 1977, Ser. No. 824,783
Claims priority, application Japan, Nov. 26, 1973, 48-131710
Int. Cl.[2] H04N 5/52
U.S. Cl. 358—174 **11 Claims**



1. An automatic gain control circuit for a television receiver comprising:

an amplifier means for amplifying a television signal containing a composite video signal having a horizontal synchronizing signal and pedestal portions;

a detector circuit for detecting the output signal from said amplifier means to produce said composite video signal;

a horizontal synchronizing signal generator to separate and produce said horizontal synchronizing signal from said composite video signal;

an automatic gain control signal generator for receiving said horizontal synchronizing signal and said composite video signal to produce an automatic gain control signal; and

means for supplying said automatic gain control signal to said amplifier means to control the gain thereof so that the level of said pedestal portions can be maintained constant;

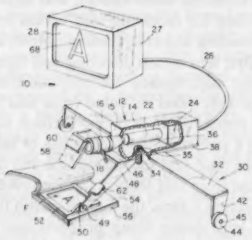
wherein said automatic gain control signal generator comprises a switch circuit supplied with said horizontal synchronizing signal from said horizontal synchronizing signal generator and said composite video signal from said detector circuit for producing a modified composite video signal in which the pedestal portion thereof has a peak value and an automatic gain control signal detecting circuit supplied with said modified composite video signal from said switch circuit for producing said automatic gain control signal by peak rectification of said modified composite video signal; and said switch circuit is adapted to be turned off by said horizontal synchronizing signal during the duration thereof and turned on at least during the duration of said pedestal portion to thereby supply and composite video signal to said automatic gain control signal detecting circuit, whereby said automatic gain control signal detecting circuit produces an automatic gain control signal in dependence upon the level of said pedestal portion greater than a predetermined reference value.

4,115,813

TELEVISION ENLARGING DISPLAY APPARATUS FOR GRAPHIC MATERIAL

Takashi Mikami, Machida, Japan, assignor to Mikami & Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,395
Claims priority, application Japan, Jul. 28, 1976, 51-99561[U]
Int. Cl.[2] H04N 5/65, 7/18
U.S. Cl. 358—229 **10 Claims**



1. Optical apparatus for displaying enlargements of a graphic copy, comprising:

a television camera having a lens for picking up an optical image from said graphic copy;

a platform means carrying said camera in an elevated position above said graphic copy and rotatable on a horizontal axis to lift said camera;

an arm secured to said platform means and extending downwardly therefrom toward said copy;

a frame means secured to said arm and disposed to bear on said copy and to outline a scanning field on said copy, whereby said frame means is lifted off said copy when said platform means and said arm are rotated on said horizontal axis; and

an image reflector means supported by said platform means and disposed in an optical path between said frame and said lens for transmitting an image of said copy to said lens.

4,115,814

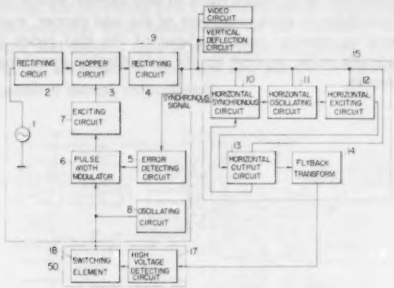
CIRCUIT FOR EXTINGUISHING ABNORMALLY HIGH VOLTAGE IN TELEVISION RECEIVER

Kimito Kosaka; Kunio Umehara, and Takeshi Maruyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1977, Ser. No. 768,752
Claims priority, application Japan, Feb. 20, 1976, 51-17066
Int. Cl.[2] H04N 5/44, 5/68
U.S. Cl. 358—243 **24 Claims**

1. An abnormally high voltage extinguishing circuit for a

television receiver including a switching-type stabilized power supply circuit having a chopper circuit and a control circuit for controlling the switching operation of said chopper circuit so as to generate a stabilized output voltage from the power supply circuit, and a horizontal deflection circuit having a horizontal output circuit and a flyback transformer, said horizontal deflection circuit receiving the stabilized output voltage from said power supply circuit, supplying a current to a horizontal deflection coil, and also supplying a high voltage to an



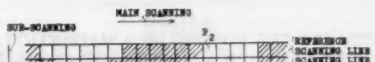
anode of a picture tube through said flyback transformer; said abnormally high voltage extinguishing circuit comprising first means for generating a voltage proportional to said high voltage and for detecting whether or not the generated voltage exceeds a predetermined level and second means connected with said first means for operatively controlling said control circuit to stop the switching operation of said chopper circuit when the voltage generated by said first means exceeds the predetermined level.

4,115,815

FACSIMILE SIGNAL CODING METHOD

Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka, and Yasushi Wakahara, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Nov. 1, 1976, Ser. No. 737,072
Claims priority, application Japan, Oct. 30, 1975, 50-130842
Int. Cl.[2] H04N *1/40*
U.S. Cl. 358—260 **2 Claims**



1. A method of coding a facsimile signal, comprising:

classifying information change picture elements of a facsimile signal into two classes according to the information change directions of the picture elements;

selecting information change picture elements classified as having an information change from white to black;

coding the shorter of a first distance from an instant information change picture element to be coded to a first reference black-to-white information change picture element immediately proceeding said instant information change picture element on the same scanning line, and a second distance on an immediately preceeding scanning line from a picture element just above said instant information change picture element to a second white-to-black information change picture element immediately succeeding a picture element just above said first reference black-to-white information change picture element;

selecting information change picture elements classified as having an information change from black to white;

predicting a distance from an instant information change picture element to be coded to the immediately preceeding information change picture element on the basis of a previously coded run; and

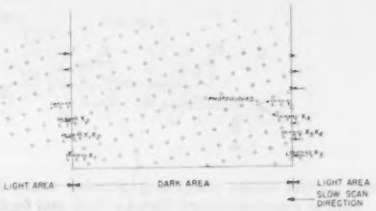
coding the error between the predicted value and the run length of the instant run.

4,115,816

ELECTRONIC SCREENING

William West Moe, Stratford; Robert William Lotz, Darien; Ethan Robert Green, Monroe, and Rodolfo Fazio, Southport, all of Conn., assignors to Printing Developments, Inc., New York, N.Y.

Division of Ser. No. 414,798, Nov. 12, 1973, Pat. No. 3,983,319.
This application Aug. 16, 1976, Ser. No. 714,482
Int. Cl.[2] H04N *1/40, 1/46*
U.S. Cl. 358—283 **19 Claims**



1. In an apparatus for scanning an input image and forming a corresponding output image in halftone dots, the combination of scanning means for scanning successive points of the input image and generating an output signal representative of tonal densities of said successive points of the input image, at least three photocells, separate from said scanning means, a first being responsive to the input image in a region displaced from but adjacent to the point instantaneously being scanned to produce a first output, a second being centrally located with respect to the other two and responsive to the input image in a region including said instantaneously scanned point to produce a second output, and the third being responsive to a region of said input image equally displaced from the point instantaneously being scanned and on the side of said point opposite the region to which said first photocell is responsive to produce a third output, means including comparator means responsive to said photocell outputs for generating a dot-offset signal that depends on the relative magnitudes of said first, second and third photocell outputs, and means responsive to said dot-offset signal for adjusting the position and shape of said halftone dots in said output imge.

4,115,817

DEVICE INCLUDING A UNIT FOR FEEDING A RECORDING MEDIUM AT A PREDETERMINED SPEED TO A UNIT FOR PROCESSING THAT PROVISIONAL RECORD INTO A FINAL ONE WHICH IS FORMED ON THE MEDIUM FED AT ANOTHER SPEED

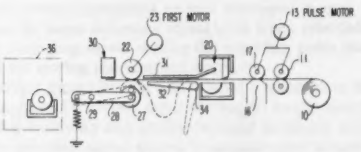
Etsuo Suzuki, and Hidekazu Sakurai, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,972
Int. Cl.[2] H04N *1/12, 1/31*
U.S. Cl. 358—288 **9 Claims**

1. A device for processing a recording medium having a leading edge, comprising variable speed feed means for feeding the recording medium along a predetermined path with a preselected one of a plurality of speeds, means for recording a provisional record of a pattern on the recording medium being fed by said feed means, means forwardly along said path of said feeding means and said recording means for processing said

provisional record into a final record of said pattern, store means between said processing means and one of said variable speed feed means and said recording means that is nearer to said processing means to be put normally in a first position for guiding the recording medium fed thereto by said variable speed feed means towards said processing means and controllably in a second position for storing the recording medium fed thereto by said variable speed feed means, controllable feed means for further feeding the stored recording medium to said processing means, and control means for controlling said store means and said controllable feed means, wherein:

said controllable feed means comprises a feed roller transversely of said path, a cooperating member put normally in a first location of disengaging with said roller and controllably in a second location of engaging therewith, and controllable drive means put controllably in a first mode of operation for making said feed roller feed at a predetermined speed the recording medium put between said feed roller and normally in a second mode of operation for rendering said feed roller to feed nothing;



said control means comprising detector means along said path at a predetermined distance from said feed roller for detecting passage thereby of the leading edge of the recording medium fed by said variable speed feed means to produce a start signal, first means responsive to said start signal for putting said cooperating member into said second location and said store means into said second position, second means for putting said controllable drive means into said first mode of operation a first predetermined interval after the last-mentioned leading edge reaches said feed roller, and third means for putting said cooperating member back into said first location, said store means back into said first position, and said controllable drive means back into said first mode of operation approximately a second predetermined interval after production of said start signal, said second predetermined interval being longer than said first predetermined interval.

4,115,818

APPARATUS FOR MONITORING EVOLUTIVE INFORMATION

Jean-Paul Lesieur, Massy, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Jan. 12, 1977, Ser. No. 758,840
Int. Cl.[2] G11B 5/00; H04N 5/795
U.S. Cl. 360—5 **8 Claims**

1. A system for monitoring evolutive information data picked up at points in an informatics equipment and analyzing selected information data sequences comprising the combination of:

means adapted to be operatively connected to the information equipment to record evolutive information data on a multi-track loop rotatable magnetic carrier and for reading said recorded data, said means comprising as many erase/write and as many reading heads as are tracks, each operable in an erase/write condition or a read-out condition,

means for selectively interrupting the recording of said evolutive information and switching the operation of said means for recording and reading from its erase/write condition to its read-out condition,

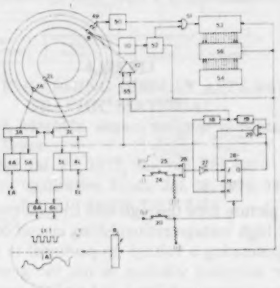
visual display means having inputs connected to display information derived from outputs of the said reading heads,

synchronizing means connected to said visual display means for synchronizing the display with the rotation of the said carrier,

pulse trigger means for repetitively activating the synchronizing means,

means responsive to the interruption of the recording of said data to cause an index marking the origin of the information data sequences to be displayed to be written in or recorded on an index track of said carrier, means to read said index at each rotatation of the said carrier, and,

means to convert each read-out of the said index into a trigger pulse applied to the said display synchronizing means,



manually controllable means for introducing a variable delay between the read out of the index and the application of a corresponding trigger pulse to the said display synchronizing means, said manually controllable means including

a clock pulse generator,

a clock pulse counter connected to count the clock pulses of said generator,

a manually operable pulse count selector, and

comparator means connected to said counter and said selector for issuing a trigger pulse at the identity of the count in said clock pulse counter and of a count selected in said pulse count selector and for stopping the count in said counter and resetting it to zero up to the next occurrence of the index on the index track of said carrier.

4,115,819

SYSTEM FOR THE EDITING OF A MAGNETIC TAPE IN ONE VTR WITH A PORTION OF A SIGNAL REPRODUCED FROM A TAPE ON ANOTHER VTR

Yasuo Shigeta, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,070
Claims priority, application Japan, Jan. 23, 1976, 51-6770
Int. Cl.[2] H04N 5/78
U.S. Cl. 360—14 **5 Claims**

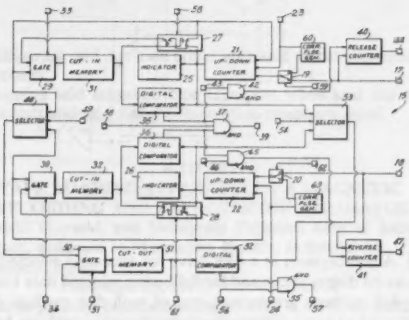
1. A tape editing system having a first VTR with means for effecting forward and reverse movement of a first tape therein and being operable, during forward movement of said first tape, in a playback mode for reproducing video signals recorded on said first tape, a second VTR with means for effecting forward and reverse movement of a second tape therein and being selectively operable, during forward movement of the second tape, in a playback mode for reproducing video signals recorded on said second tape and in a record mode for recording on said second tape the video signals being simultaneously reproduced from said first tape, and an editing control apparatus comprising

first and second tape address counting means for up- and down-counting of addresses along said first and second

tapes, respectively, during the forward and reverse movement, respectively, of the first and second tapes;

first and second cut-in address memory means operable for storing addresses indicated by said first and second tape address counting means, respectively, at the commencement of selected portions of the video signals on the first and second tapes, respectively;

first and second cut-in comparator means connected with said first and second tape address counting means and said first and second cut-in address memory means, respectively, for providing first and second cut-in output signals, respectively, upon coincidence of the addresses in said first and second tape address counting means with the stored addresses in said first and second cut-in address memory means, respectively;



first and second reverse counting means being operable by said first and second cut-in output signals, respectively, during reverse movement of said first and second tapes, respectively, said first and second reverse counting means including, respectively, first and second means for halting the reverse movement of said first and second tapes at stand-by addresses located at equal predetermined distances along said first and second tapes in the reverse direction from the cut-in addresses of said first and second tapes; and

means for initiating the simultaneous forward playback modes of said first and second VTRs and causing the change-over of said second VTR to the recording mode upon the occurrence of said second cut-in output signal.

4,115,820

SYSTEM FOR REPRODUCING A VIDEO SIGNAL

Minoru Morio, and Masahiro Kambara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1975, Ser. No. 630,332

Claims priority, application Japan, Nov. 11, 1974, 49-129687; Jan. 16, 1975, 50-7375

Int. Cl.[2] H04N 5/795

U.S. Cl. 360—33 **8 Claims**

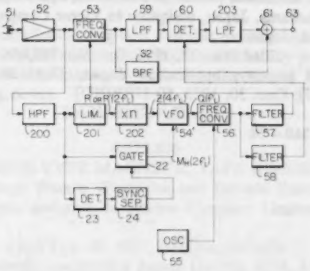
1. A system for reproducing a video signal recorded on a magnetic recording medium, said video signal containing at least a luminance signal which is balanced-modulated on a carrier signal including a synchronizing pulse signal portion having pulses of a larger amplitude than other signal portions, said system comprising:

magnetic transducer means for reproducing said video signal from said magnetic recording medium;

a synchronous detector for synchronously detecting said balanced-modulated luminance signal;

supply means to supply a reference carrier signal to said synchronous detector; and

control means to control the phase of said reference carrier signal, said control means comprising means connected to said transducer means for controlling the phase of said reference carrier signal continuously with a component of



said reproduced video signal and during said synchronizing signal pulses of said modulated luminance signal.

4,115,821

NONRECORDED SECTION DETECTION IN A TAPE RECORDER APPARATUS

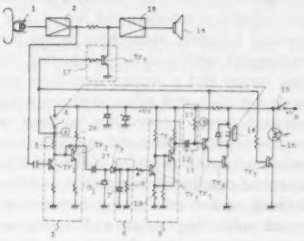
Yoshimasa Okada, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1976, Ser. No. 734,460

Claims priority, application Japan, Oct. 21, 1975, 50-127003

Int. Cl.[2] G11B 15/18, 15/48

U.S. Cl. 360—72 **7 Claims**



1. In a nonrecorded section detection system of a tape recorder apparatus comprising a nonrecorded section detection circuit, a main power switch for the tape recorder, and a driving means for activating a plunger in order to release a nonrecorded section detection mode in response to an output signal of the nonrecorded section detection circuit, the improvement comprising:

a switching means interposed between the nonrecorded section detection circuit and the driving means;

an auxiliary power supply switch connected to a power supply terminal through said main power switch, said auxiliary power supply switch being placed in its ON condition only when the tape recorder apparatus is in the nonrecorded section detection mode; and

circuit means for applying a bias voltage from said power supply terminal to said switching means only via said auxiliary power supply switch.

4,115,822

AUTOMATIC START AND SHUT-OFF APPARATUS FOR MAGNETIC-TAPE SOUND RECORDER

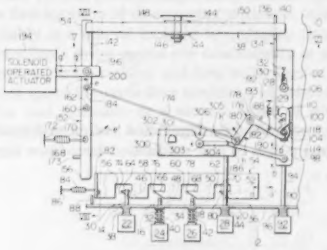
Kunihiko Kitazawa; Masuichiro Mimura, and Mitsuo Iwata, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Dec. 28, 1976, Ser. No. 755,056

Claims priority, application Japan, Dec. 29, 1975, 51-176583[U]; Dec. 30, 1975, 50-178303[U]

Int. Cl.[2] G11B *15/48*

U.S. Cl. 360—74 13 Claims



1. An automatic start and shut-off apparatus for a magnetic-tape sound recorder having a plurality of modes of operation and including component members having operative conditions for selectively effecting each of said modes of operation and manually-operable, mode-selecting and selected-mode holding means for selecting a desired one of said modes of operation and actuating said component members to effect the selected mode of operation, said means having a first condition operative to hold the selected mode of operation and a second condition clearing the selected mode of operation, comprising locking means operable independently of said mode-selecting and selected-mode holding means and shiftable manually into an operative condition locking said component members in inoperative conditions thereof and shiftable automatically into an inoperative condition releasing the inoperative conditions of the component members, unlatching means having a first condition engageable with said mode-selecting and selected-mode holding means and a second condition unengageable with the mode-selecting and selected-mode holding means, motion translating means intervening between said locking means and said unlatching means and operative to convert the inoperative and operative conditions of the locking means into the first and second conditions, respectively, of the unlatching means, unlocking means intervening between said locking means and said unlatching means and having an operative condition producing in said locking means the inoperative condition thereof and an inoperative condition allowing the locking means to hold the operative condition thereof, said unlatching means being shiftable irrespectively of said first and second conditions thereof and independently of said motion translating means between an operative condition producing in said unlocking means the operative condition thereof and an inoperative condition producing in the unlocking means the inoperative condition thereof, said unlatching means being in engagement with said mode-selecting and selected-mode holding means for shifting the mode-selecting and selected-mode holding means from the first condition to the second condition thereof when the unlatching means in said first condition is shifted from said inoperative condition thereof to said operative condition thereof, and power-operated actuating means drivingly connected to said unlatching means and operative to selectively produce the operative and inoperative conditions of the unlatching means irrespectively of the first and second conditions of the unlatching means.

4,115,823

TRACK FOLLOWING SERVOSYSTEM FOR DATA STORAGE APPARATUS

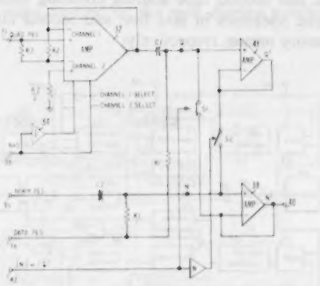
Robert Duncan Commander, Eastleigh; Peter Alan Edward Gardner, Southampton, and John Richard Taylor, Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,328

Claims priority, application United Kingdom, Dec. 22, 1976, 53582/76

Int. Cl.[2] G11B *21/10, 17/00, 5/82*

U.S. Cl. 360—77 9 Claims



1. A servosystem in a disk drive for accessing selected data tracks on disk surfaces and for following selected data track as the disk surfaces are rotated, one of such disk surfaces being dedicated to servo information, and the other surfaces having data information with servo information sectors in the data tracks, having accessing means including movable magnetic heads coupled to an actuator that is responsive to servo signals comprising:

means for generating a first continuous position signal having high frequency components derived from the dedicated servo disc surface, said continuous position signal including linear and non-linear signal portions;

means for modifying said non-linear signal portions to linear signal portions in response to sensed d.c. voltage levels of previous linear signal portions preceding the non-linear signal portions;

means for generating a second position signal having d.c. and low frequency components derived from data surface servo information;

means for forming a hybrid position signal from said modified and second position signals; and

servo control circuit means for controlling the movement of said accessing means relative to the data track being followed in response to said hybrid position signal.

4,115,824

METHOD FOR REGAINING SYNCHRONIZATION BETWEEN A VISUAL IMAGE PROJECTOR AND AN ASSOCIATED AUDIO PLAYBACK MACHINE

Marvin I. Mindell, Pittsford, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,558

Int. Cl.[2] G11B *31/00*

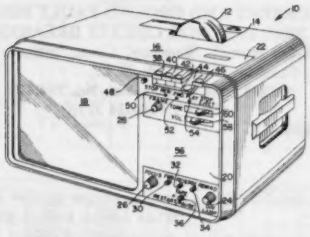
U.S. Cl. 360—80 12 Claims

1. Method of changing visual presentations in a series of visual presentations to a selected visual presentation and regaining synchronization between said selected visual presentation and an associated magnetic tape having both cue tone and audio signals recorded thereon comprising the steps of:

changing said visual presentations in a selected direction to a selected one of said visual presentations;

counting said visual presentations as they are changed in said selected direction;

transporting said magnetic tape in said selected direction;
sensing said cue tones recorded on said magnetic tape as said magnetic tape is transported;
counting said sensed cue tones;



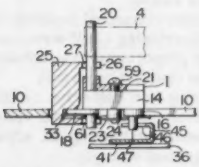
comparing said cue tone count with said visual presentation count;
stopping said magnetic tape transport when said cue tone count and said visual presentation count are equal.

4,115,825

TAPE LOADING APPARATUS IN A MAGNETIC RECORDING AND REPRODUCING APPARATUS

Yoshiaki Hayashi, and Nobuyoshi Fujimori, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 25, 1977, Ser. No. 790,500
Claims priority, application Japan, May 4, 1976, 51-51026
Int. Cl.[2] G11B *15/66*
U.S. Cl. 360—85 **12 Claims**



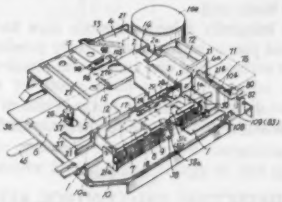
1. In a magnetic tape recording and reproducing device of the helical scanning type, apparatus for loading in said device a magnetic tape contained within a cassette comprising
a base plate;
a head cylinder mounted on said base plate and having a plurality of rotary heads associated therewith; and
a pair of tape lead-out mechanisms provided at opposing sides of said head cylinder, said tape lead-out mechanisms comprising
movable means movable along guide paths located on both sides of said cylinder and extending between a first position adjacent said head cylinder and a second position adjacent a cassette loaded in said device,
a tape lead-out pin fixedly mounted on said movable means and having upper and lower portions,
driving means for advancing and retarding said movable means along said guide paths,
stopper means including
first means including means for holding, in said first position, said movable means so as to prevent said movable means from further advancing beyond said first position,
second means for preventing, in said first position, said movable means from moving in a direction substantially perpendicular to the plane including said base plate, and
third means for preventing, in said first position, said movable means from moving in the plane substantially perpendicular to the advancing direction of said movable means, said first, second and third means being integrally incorporated as part of a stationary post and said guide paths consisting of arcuate guide grooves, and
spring means for causing said movable means to abut against said base plate under resilient pressure thereby preventing said movable means from being disengaged from said guide grooves.

4,115,826

CARTRIDGE TYPE MAGNETIC TAPE RECORDERS

Satoshi Takagi; Wataru Watanabe, and Tadashi Yokota, all of Toda, Japan, assignors to Clarion Company Limited, Tokyo, Japan

Filed Feb. 10, 1977, Ser. No. 767,423
Claims priority, application Japan, Oct. 28, 1976, 51-128800; Feb. 13, 1976, 51-14012; Feb. 17, 1976, 51-15412; Feb. 19, 1976, 51-16524; Feb. 20, 1976, 51-16944; Feb. 20, 1976, 51-16945; Feb. 20, 1976, 51-16946
Int. Cl.[2] G11B *15/10, 15/24, 23/04*
U.S. Cl. 360—96 **21 Claims**



1. In a cartridge type magnetic tape recorder of the type comprising an operating frame, means for pivotally mounting one end of said operating frame to a stationary member of the tape recorder, a cartridge receiving frame for receiving a cartridge of the magnetic tape and pivotally connected to the other end of said operating frame, means for moving said receiving frame in a direction perpendicular to the direction of loading of said cartridge thereby moving said cartridge to a reproducing position, a head plate disposed at the reproducing position, a reproducing-recording head and pinch rollers mounted on said head plate, a reel drive shaft for driving the magnetic tape, and a cartridge ejecting lever extending in the direction of loading of said cartridge, the improvement which comprises a sliding frame provided with an inverted L-shaped cam slot and arranged to be slid on said operating frame by the cartridge loaded in said receiving frame, a cam mounted on said ejecting lever, and comprising upper and lower horizontal portions interconnected by an inclined portion, an operating member projecting from one side of said operating frame to engage said cam slot and said cam, and spring means for urging said cartridge ejecting lever and said sliding frame to their inoperative positions.

4,115,827

MAGNETIC TRANSDUCER FOR NARROW TRACK RECORDING AND PLAYBACK

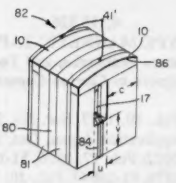
Beverley R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 22, 1975, Ser. No. 615,532
Int. Cl.[2] G11B *5/14, 5/22, 5/28*
U.S. Cl. 360—121 **20 Claims**

1. A magnetic transducer suitable for recording and reproduction on narrow tracks of a magnetic medium, comprising:
(a) a magnetic core having at least two confronting poles defining at least one transducing gap therebetween, and having a width defining a recording track width, said magnetic core having a first planar surface extending over both side poles and said gap;

(b) a supporting composite body comprising a nonmagnetic front portion and a contiguous magnetic back portion and having a first planar surface extending over both said nonmagnetic front portion and said magnetic back portion;

(c) a first bond integrally joining said magnetic core at said first planar surface thereof to said first planar surface of said composite body with said nonmagnetic front portion of said composite body adjacent to and spanning said



transducing gap of said magnetic core, said magnetic core, composite body and bond thus forming an integral transducer body; and

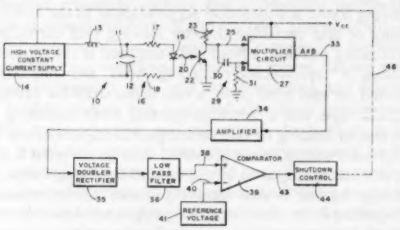
(d) said integrally joined magnetic core having a second exposed planar surface substantially parallel with its first planar surface, said first and second planar surfaces defining a selected narrow track width of a substantially smaller dimension relative to the width of said magnetic core prior to joining to said composite body.

4,115,828

ARC DETECTION AND CONTROL APPARATUS

Don H. Rowe, Portola Valley, and Michael W. Sasnett, Los Altos, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Apr. 5, 1977, Ser. No. 784,699
Int. Cl.[2] H02H *7/22, 3/32*
U.S. Cl. 361—1 **4 Claims**



1. Arc detection and control apparatus for a high power gas discharge laser having first and second electrodes and a constant current DC power supply connected across said electrodes comprising

a light emitting diode coupled across said electrodes and adapted to emit light having an intensity proportional to the voltage across said electrodes,

a photosensitive detector optically coupled to said diode and adapted to produce a current proportional to the intensity of light emitted by said diode,

means for converting said detector current into a detector voltage, said voltage being substantially less than and proportional to said voltage across said electrodes,

means for differentiating said detector voltage,

means for multiplying said detector voltage and the output of said differentiating means,

means for comparing the output of said multiplying means with a reference voltage whereby to produce an output when the former exceeds the latter, and

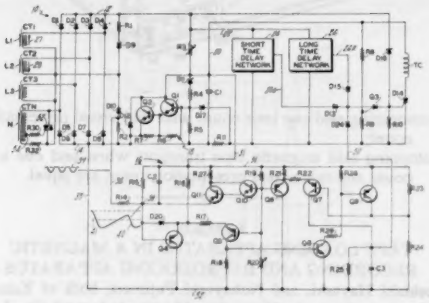
control means responsive to the output of said comparing means and operatively connected to said power supply to disconnect the latter from said electrodes upon occurrence of an arc.

4,115,829

OVERCURRENT AND GROUND FAULT RESPONSIVE TRIP UNIT FOR CIRCUIT BREAKERS

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,488
Int. Cl.[2] H02H *3/16*
U.S. Cl. 361—42 **12 Claims**



1. A circuit breaker electronic trip unit comprising, in combination:

A. current sensor means linked to the various conductors of a distribution circuit to be protected;

B. a rectifying network connected to the output of said current sensor means;

C. a burden resistor connected in circuit with said rectifying network for developing a half-wave rectified ground fault signal voltage proportional to an imbalance in the currents flowing in the distribution circuit;

D. means filtering said half-wave rectified signal voltage such as to develop a ripple signal voltage;

E. variable means establishing an adjusted ground fault signal pick-up level voltage;

F. a differential amplifier having a first input terminal connected to receive said ripple signal voltage and a second input terminal connected to receive said pick-up level voltage;

G. a timing capacitor and a resistor connected in parallel;

H. a current source adjusted to supply a determined magnitude of charging current to said capacitor; and

I. electronic switch means operating in series with said capacitor as a variable duty cycle switch under the control of said differential amplifier, said switch means being closed during the intervals the peaks of said ripple signal voltage exceeds said pick-up level voltage to permit charging of said capacitor and being open during the intervals said pick-up level voltage exceeds the valleys of said ground fault signal voltage to terminate charging of said capacitor, whereby said capacitor is charged to a trip initiating voltage at a rate determined by the amplitude of said ripple signal voltage.

4,115,830

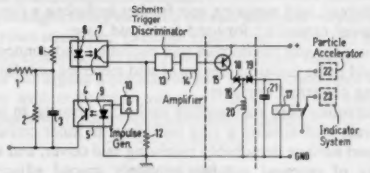
MONITORING SYSTEM FOR HIGH-VOLTAGE SUPPLY

Volker Adolf Wilhelm Stieber, Lafayette, Calif., assignor to Applied Radiation Corporation, Walnut Creek, Calif.

Filed Apr. 1, 1977, Ser. No. 783,781
Int. Cl.[2] H01H *47/24*
U.S. Cl. 361—187 **6 Claims**

1. A current supply monitoring system for the kilovolt range high-voltage supply of an ionization chamber for the supervision of particle accelerators, comprising in combination:

(a) a substantially hysteresis free measuring system means for measuring the level of the high voltage supply;
(b) separator means for connection to the kilovolt range high voltage supply and electrically separating and isolating



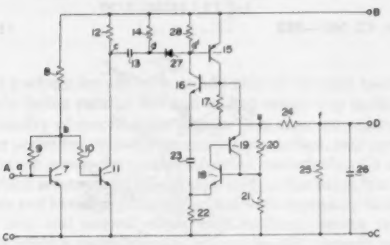
the high voltage supply kilovolt range voltages from the measuring system means; and
(c) switch means for connection to the measuring system means and also to the particle accelerator for supervising operation of the particle accelerator.

4,115,831

VELOCITY DETECTING APPARATUS INSENSITIVE TO NOISE

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,859
Claims priority, application Japan, Aug. 5, 1976, 51/93645
Int. Cl.[2] H02P *5/00*
U.S. Cl. 361—236 **2 Claims**



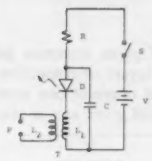
1. A velocity detecting apparatus comprising;
a waveform shaping circuit including a first stage switching transistor connected in a rotational speed control loop for a rotary machine, for amplifying and shaping an A.C. signal derived from a velocity sensor, said switching transistor being operated between a saturation region and an active region;
a waveform transform circuit having a stable state and a quasi-stable state for a given period after the application of an input signal, for transforming an output signal of said waveform shaping circuit to a square wave having a given duration;
an integration circuit for integrating said square wave with time to produce an integrated output; and
a comparator for comparing said output voltage of said integration circuit with a reference voltage;
wherein;
the beginning of said quasi-stable state of said waveform transform circuit is established by the beginning of said active region of said first stage switching transistor of said waveform shaping circuit;
said integration circuit includes first and second series-connected resistors arranged to voltage divide said square wave;
one end of an integrating capacitor is connected to the junction of said first and second resistors; and
the resistances of said first and second resistors are selected such that a duty factor of said square wave during constant velocity control lies between approximately 4/5 and 1/1.

4,115,832

IGNITER UTILIZING A NEGATIVE RESISTANCE LIGHT EMITTING DIODE

Tutomu Nakamura, Akashi; Junichiro Shigemasa, Yamatokoriyama, and Zenpei Tani, Tondabayashi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,627
Claims priority, application Japan, Dec. 16, 1975, 50-150341; May 19, 1976, 51-58181
Int. Cl.[2] F23Q *3/01*
U.S. Cl. 361—256 **5 Claims**



1. An igniter circuit for a gaseous material having means for indicating a deficiency in the quantity of gaseous material or a deficiency in the operation of said circuit comprising:
a. a voltage source for supplying energy to said igniter circuit;
b. a negative resistance light emitting diode having a predetermined threshold voltage and selectable conductive and nonconductive states, said diode emitting light in said conductive state when the voltage applied across said diode exceeds said predetermined threshold voltage;
c. capacitor means connected in parallel with said diode and coupled to said voltage source to receive a charging current therefrom when said diode is in said nonconductive state, said capacitor means switching said diode to said conductive state when said capacitor means is charged to at least said predetermined threshold voltage to thereby discharge said capacitor means through said diode;
d. means for generating a voltage for electrically igniting said gaseous material in response to the discharge of said capacitor means through said diode; and
e. means for transmitting the light emitted from said diode to an observation point externally of said circuit; whereby the presence of light emission from said diode and the absence of ignition of said gaseous material is indicative of a deficiency in the quantity of gaseous material, while the absence of light emission and the absence of ignition of gaseous material is indicative of a deficiency in the operation of said ignition circuit.

4,115,833

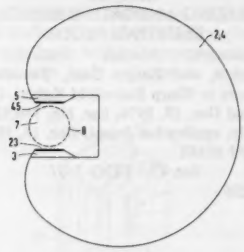
POWER CAPACITOR

Hans-Jürgen Cirkel, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Aug. 8, 1977, Ser. No. 822,675
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635471
Int. Cl.[2] H01G *1/013*
U.S. Cl. 361—303 **5 Claims**

1. Power capacitor with minimal self-inductance comprising a stack of metal layers mutually superimposed perpendicularly to a given axis, with respective layers of insulation disposed between mutually adjacent metal layers of said stack, said metal layers and said insulation layers being formed laterally with mutually aligned cut-outs in vicinity of said given axis, said mutually aligned cut-outs collectively forming a free

channel within said stack open at opposite ends and along a side thereof, respective surface portions of alternating layers of said metal layers projecting into said channel above one another as electrodes of given common polarity, the surface portions of the metal layers of respective opposite common polarity being disposed opposite one another and symmetrically with respect to said given axis in said channel.



4,115,834

DIELECTRIC COMPOSITION AND DEVICE CONTAINING SAME

William M. Robinson, and Edward Lobo, both of New Bedford, Mass., assignors to Cornell-Dubilier Electric Corp., Newark, N.J.

Filed Aug. 23, 1976, Ser. No. 716,663
Int. Cl.² H01G *4/22*
U.S. Cl. 361—318 **11 Claims**

1. A liquid dielectric composition useful as a capacitor impregnant consisting essentially of, approximately by weight:

a. 97 to 51 parts of a bis (C_{6-12} alkyl) phthalate;

b. 2 to 48 parts of butylated monochloro diphenyl oxide; and

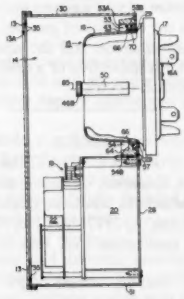
c. 0.001 to 5 parts of epoxide stabilizer.

4,115,835

ELECTRIC LOAD RESEARCH DEVICE INCLUDING AN ENCLOSURE HAVING ADJUSTABLE METER POSITIONS

William P. Doby, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 680,659, Apr. 27, 1976, Pat. No. 4,063,661.
This application Sep. 19, 1977, Ser. No. 834,366
Int. Cl.² H02B *9/00*
U.S. Cl. 361—370 **5 Claims**



1. An electric load research device comprising:

an elongated enclosure including a rear wall and top, bottom and opposing side wall portions extending forward from said rear wall and terminating at a front opening of the enclosure, and said rear wall including a hole opening, and said elongated enclosure further including a lid mountable over said top, bottom and side wall portions and closing said front opening;

a metering unit having a base carrying a meter movement equipped with a pulse initiating device on a forward side thereof and contact terminals extending from the rear side thereof, said metering unit further including a cup-shaped cover extending forward from said base;

a recorder unit mounted in said enclosure and connectable to said pulse initiating device of said metering unit for receiving electrical impulses;

a mounting ring surrounding said hole opening in said rear wall, said mounting ring including an inner circular support surface detachably receiving said cover, and a plurality of recessed notches arcuately spaced adjacent said support surface;

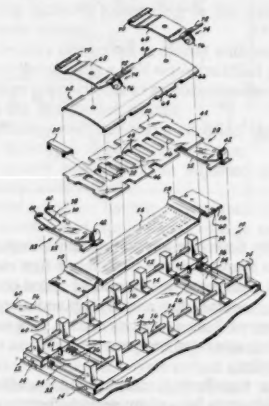
a bracket assembly including a strap member having front and rear portions, said rear portion being removably received by different ones of said plurality of recessed notches when said enclosure has different rotated positions relative to said metering unit, and said bracket assembly further including a fastening means releasably securing said cover to said forward portion of said strap member so as to attach said metering unit to said enclosure in alternate preselected rotated positions of the enclosure.

4,115,836

COOLING SYSTEM FOR DUAL-IN-LINE PACKAGES

Robert V. Hutchison, Oceanside; Peter P. Gregg, Vista, and James J. MacBride, Carlsbad, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 25, 1977, Ser. No. 790,291
Int. Cl.² H05K *7/20*
U.S. Cl. 361—382 **11 Claims**



1. A packaging system for electronic equipment comprising at least one island, including:

a plurality of integrated circuit packages having leads thereon,

an interconnection medium having first electrical conductors thereon,

a cooling frame fastened to said interconnection medium configured such that a plurality of sections of thermally conductive material are situated in parallel spaced apart relationship across the surface of said interconnection medium,

connector means having a plurality of electrical contacts and operatively connected in a predetermined relationship to said interconnection medium at opposite ends thereof and providing respective electrical paths between said integrated circuit packages and said interconnection medium first conductors,

a heat sink carrier means disposed between said frame sec-

tions and in thermal conductive relationship therewith and having package supporting means thereon,

second conductor means adjacent said heat sink carrier plate and extending into said connector means at each end of said interconnection medium,

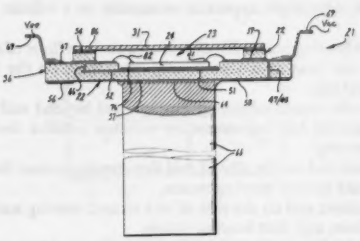
said packages being mounted on said heat sink carrier means in rows straddling package supporting means and electrically connected to said second conductor means,

means for urging a portion of said second conductor means into said connector means so as to provide electrical contact with the electrical contacts therein.

4,115,837
LSI CHIP PACKAGE AND METHOD

Robert J. Beall, San Jose, and John J. Zasio, Sunnyvale, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 270,448, Jul. 10, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,853
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—388 **11 Claims**



1. In a package for use with an LSI chip of the type having oppositely facing parallel first and second major chip surfaces and a plurality of spaced apart contact pads disposed adjacent the outer perimeter on said first major chip surface, said package including a one-piece carrier formed exclusively of a ceramic which is essentially all alumina, said carrier being free of glass seals and having a rectangular base with oppositely facing parallel first and second major base surfaces, having wall means defining a recess extending downwardly through said first major base surface for receiving the chip, a chip carrying surface in said recess parallel to the first major base surface and inset from the first major base surface, means securing the chip to said chip carrying surface so that the second chip surface is in contact with the chip carrying surface and the first chip surface is in close proximity to the first major base surface, a raised part carried on said first major base surface surrounding said recess and being spaced inwardly from the outer perimeter of the base, a metallic cooling stud secured to said second major base surface generally opposite said chip carrying surface and extending away from said second major base surface outwardly in a direction away from said base for exposure to the atmosphere for cooling by air, a lead pattern formed on said first major base surface extending below said raised part and into close proximity to said recess whereby said lead pattern and said pads on a chip in said recess each have exposed surfaces facing in the same direction into a region extending from said chip carrying surface and said first chip surface outwardly in a direction away from said carrier thereby permitting access through said region to connect leads between said exposed surfaces of said pads and said lead pattern, said lead pattern extending on said first major base surface to all four sides of said base, and a plurality of relatively rigid conductive leads mounted on said first major base surface near the outer perimeter of said base in contact with said lead pattern, said conductive leads extending outwardly from all four sides of said rectangular base and having contact areas lying in a plane generally parallel to said first major base surface, said contact areas facing in a direction away from the base and opposite the direction in which the cooling stud extends from said base.

4,115,838
PACKAGING OF A SEMICONDUCTOR

George J. Yagusic, Litchfield, and Richard A. Boronosky, Thomaston, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Aug. 17, 1976, Ser. No. 715,001
Int. Cl.[2] H05K 5/06
U.S. Cl. 361—388 **4 Claims**

1. A package for an electrical component comprising:

(a) a housing having side wall means and opposite open ends adapted to telescope around said electrical component;

(b) base means providing a surface upon which each said electrical component and said housing are mounted;

(c) a terminal board, said terminal board being formed of a non-conductive material and including a plurality of openings in spaced-apart relation;

(d) a first plurality of terminals;

(e) conductive eyelet means mounting one end of each of said first plurality of terminals, said conductive eyelet means received through respective openings in said terminal board whereby each of said first plurality of terminals is insulated from the others;

(f) means mounting said terminal board within said housing so that the other end of said terminals extend outwardly from said housing;

(g) said electrical component including a second plurality of terminals, each terminal of said second plurality of terminals received through and electrically connected to one of said conductive eyelet means; and,

(h) means encapsulating said terminal board and electrical component within said housing.

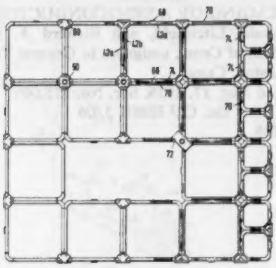
4,115,839
SELF-SUPPORTING MODULAR SWITCHBOARD PANEL

Herbert Hummel, Niedereschach, Fed. Rep. of Germany, assignor to Hans Kreutzenbeck GmbH, Velbert-Neviges, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,206
Int. Cl.[2] H02B 1/04; H01H 9/02
U.S. Cl. 361—393 **15 Claims**

1. A self-supporting modular switchboard panel comprising: a plurality of substantially rectangular one-piece frame elements having closed faces on four sides and open top and bottom faces disposed in matrix-type array whereby a side face of each adjacent frame element is in tangential parallel relation with an adjacent frame side face along inner portions of the matrix-type array, and said four sides of said frame elements define corner edges where the sides meet wherein said edges

are set at an angle of substantially 45° relative to the side faces so that the intersection of four corner edges of four frames define a square-shaped aperture, and means for fastening said



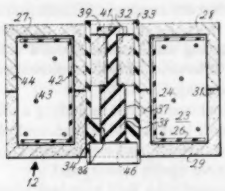
frames together at said corner edges whereby said frames are constrained from motion and the top and bottom faces of all frames are all coplanar and said means for fastening said frames lie below said top face and above said bottom face.

4,115,840

PRINTED CIRCUIT BOARD WITH FLUOROCARBON COATED INDUCTOR

Steven A. Horton, Los Alamitos, Calif., assignor to The Anaconda Company, Greenwich, Conn.

Division of Ser. No. 504,773, Sep. 10, 1974, Pat. No. 3,973,321.
This application Mar. 8, 1976, Ser. No. 664,688
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—400 **5 Claims**



1. An inductor comprising in combination:

A. a coil of insulated wire,

B. a ferrite core,

C. a helically threaded tubular surface associated with said core,

D. an adjustable ferrite slug,

E. a helically threaded cylindrical surface associated with said slug and fitting said tubular surface,

F. a fine layer of particles of fluorocarbon polymer coating said wire and said surfaces, said layer having been applied by immersion of the inductor in a bath of said polymer, a sufficient amount of said polymer having submicron size particles.

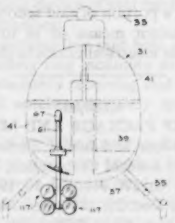
2. The inductor of claim 1 disposed onto a printed circuit board having a plurality of conducting surfaces and non-inductor circuit elements wherein an adherent conformal coating is applied thereto, and only said inductor being free from adherence to the adherent conformal coating.

4,115,841

SEARCHLIGHT

Eli James Alexander, 9024 David Ave., Los Angeles, Calif. 90034

Filed Dec. 2, 1976, Ser. No. 746,879
Int. Cl.[2] F21M *3/00*
U.S. Cl. 362—44 **21 Claims**



1. A searchlight apparatus mountable on a vehicle comprising

first bearing means fixedly mountable on a floor of a vehicle,

second bearing means fixedly mountable on the hull of a vehicle,

tubular means extending through and beyond said first and second bearing means for rotation relative thereto and having

a first end on the side of said first bearing means distal from said second bearing means,

a second end on the side of said second bearing means distal from said first bearing means,

head support means fixedly mounted on said first end of said tubular means, and

hinge support means fixedly mounted on said second end of said tubular means,

bracket means attached to said hinge support means for pivotal movement relative to said hinge support means,

link means extending through said tubular means into said head means at said first end of said tubular means and pivotally attached to said bracket means at said second end of said tubular means,

means operatively attached to said link means in said head means and extending out of said head means for actuation of said link means by an operator, and

lamp means mounted on said bracket means for movement about the axis of said hinge support means as said actuation means is actuated by an operator to move said link means longitudinally in said tubular means and for movement about the axis of said tubular means as said actuation means is actuated by an operator to rotate said tubular means about its axis.

4,115,842

FLASHLIGHT AND FLASHLIGHT CHARGING RECEPTACLE

Donald A. Keller, Irvine, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

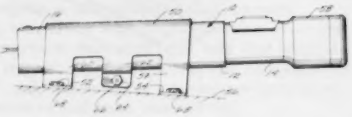
Filed Jul. 29, 1976, Ser. No. 709,764
Int. Cl.[2] F21L *7/00*
U.S. Cl. 362—183 **4 Claims**

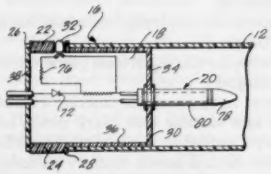
1. A flashlight, battery charger, and auxillary power source comprising:

(a) a flashlight having a head with a flashlight bulb, an insulative battery housing, rechargeable batteries in the battery housing and in electric circuit with the flashlight bulb, and a female electrical receptacle within said housing at a butt end of the flashlight, the female receptacle having positive and negative terminals, the circuit to the female receptacle providing the batteries with charging current during a charging mode and drawing current from the batteries during an auxillary use mode, the auxillary

use mode having the female receptacle in receipt of a male plug of an auxillary electrical device;

(b) a flashlight storage receptacle and battery charger for receipt of the flashlight, the storage receptacle and battery charger having insulative barrel means for receipt of the butt end and battery housing of the flashlight, a male plug within the barrel positioned to receive the female receptacle, positive and negative terminals of the plug for connection to the like terminals of the receptacle, charging circuit means to the male plug and adapted to be connected to a source of current to thereby charge the batteries of the flashlight;





said storage receptacle and battery charger including a circuit housing at the base thereof, the circuit housing mounting the male plug coaxially with the axis of the barrel and containing the circuit means;

said circuit means including a charging resistor and light emitting diode means in parallel circuit with the charging resistor, the parallel circuit being in series circuit with the positive terminal of the plug; and

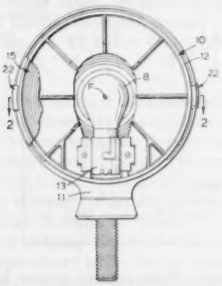
said circuit housing including a pair of diametrically opposed ears and the barrel includes a pair of diametrically opposed slots, the ears being received in the slots and the light emitting diode being mounted in one of the ears to face outwardly of the receptacle.

4,115,843

WARNING LAMP

Robert I. Nagel, Mesa, Ariz., assignor to Dominion Auto Accessories Limited, Toronto, Canada

Filed May 4, 1977, Ser. No. 793,725
Int. Cl.[2] F21V *5/02*
U.S. Cl. 362—291 **16 Claims**



1. In a signal lamp, the combination comprising

a housing having an annular wall,

a bulb having a filament within the confines of the annular wall,

a lens closing the end of the annular wall,

said lens having a front wall and a peripheral wall surrounding the front wall and telescoped over the annular wall of the housing,

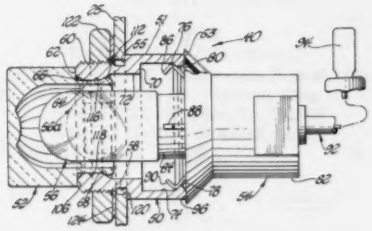
and a prism formed on said peripheral wall of said lens along at least opposed side portions of said peripheral wall of said lens and constructed and arranged to redirect light from the filament of said bulb in a direction generally at 90° to the axis of the lens.

4,115,844

LAMP ASSEMBLY

Dale L. Bull, and Norman A. Rautiola, both of Reed City, Mich., assignors to Nartron Corporation, Reed City, Mich.

Division of Ser. No. 544,773, Jan. 28, 1975, Pat. No. 3,982,122.
This application Aug. 3, 1976, Ser. No. 711,395
The portion of the term of this patent subsequent to Sep. 21, 1993, has been disclaimed.
Int. Cl.[2] F21V *17/00;* **F21Q** *3/00*
U.S. Cl. 362—382 **7 Claims**



1. A lamp assembly, comprising lamp assembly body means, said lamp assembly body means comprising a bulb socket portion at one end of said lamp assembly body means and effective for supporting a bulb therein, said lamp assembly body means being adapted to be supported by associated support means, an open end formed in a second end of said lamp assembly body means generally opposite to said one end, a cavity formed in said lamp assembly body means extending generally inwardly thereof from said open end and adapted to receive said bulb therein, lens means operatively connected to said lamp assembly body means as to be supported and carried thereby and effectively closing said open end, and detentlike latching means effective for detachably securing said lens means to said lamp assembly body means, said detentlike latching means being effective to enable said lens means to be removed from or attached to said lamp assembly body means without the necessity of having to cause relative motion as between said lamp assembly body means and said associated support means, said detent-like latching means comprising ramp-like retaining surface means formed generally in said cavity and at least first and second leg-like members integrally formed with and carried by said lens means as to be extending generally therefrom, said at least first and second leg-like members being spaced from each other and resiliently deflectable generaly toward and away from each other, said at least first and second leg-like members respectively having first and second free ends resiliently deflectable generally toward and away from each other, said first free end having a first portion formed thereon of relatively enlarged cross-sectional thickness, said second free end having a second portion thereon of relatively enlarged cross-sectional thickness, said first and second enlarged portions effectively resiliently engaging said ramp-like retaining surface means for detachably securing said lens means to said lamp assembly body means, said first and second enlarged portions effectively engaging said ramp-like retaining surface means and causing said at least first and sec-

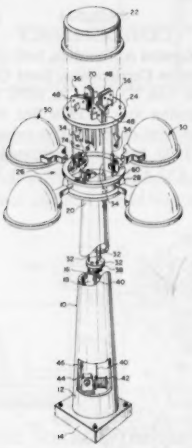
ond leg-like members to resiliently deflect toward each other when said lens means is undergoing detachmemt from said lamp assembly body means.

4,115,845

AUTOMATIC LOCKING AND SUPPORT DEVICE FOR HIGH MAST LIGHTING STRUCTURE

Edward J. Blahut, Riverside, Ill., assignor to Kapcoa Corp., Glenview, Ill.

Filed Mar. 31, 1977, Ser. No. 783,433
Int. Cl.[2] F21V *21/14*; B42F *13/00*
U.S. Cl. 362—403 **21 Claims**



1. In a high mast lighting structure including a hollow mast with an interior space extending the length thereof, an equipment carrying assembly having illumination fixtures or the like mounted thereon, the assembly including a frame positioned about the mast and at least one hoisting cable secured to the assembly and passing over the top of the mast and through the interior space to the base of the mast to enable raising or lowering of the assembly on the mast to and from the top thereof by operation of the cable, the invention comprising, locking and support means positioned between the frame and the top of the mast for releasably locking and supporting the frame in its uppermost position on the mast, said locking and support means including a first member secured to the frame and a second member secured to the top of the mast, the first member having a pair of elongate jaws pivotally mounted at one respective end thereof on the frame and disposed in face-to-face relationship, a spring operable on each said jaw to bias the jaws into generally parallel relationship in a first closed position thereof, each jaw having a cam-riding surface formed on the end thereof opposite the end mounted to the frame and an opening therein adjacent the end having said cam-riding surface, the second member including an elongate shank with opposite facing cam members extending therefrom, each cam member having a camming surface and a locking surface formed thereon, whereby movement of the assembly to the top of the mast will cause the second member to contact the first member such that the camming surfaces engage upon the cam-riding surfaces to spread the jaws and permit the cam members to enter the openings in the jaws with the perimeter of the openings resting on the locking surfaces of the cam members to maintain the assembly in locked and supported position on the mast, and release means associated with the locking and support means operable to disengage the first and second members to permit movement of the assembly away from the top of the mast.

4,115,846

REMINDER SYSTEM

Buddy Laine, 10454 Cumberland Dr., Sun City, Ariz. 85051

Filed Feb. 22, 1977, Ser. No. 770,437
Int. Cl.[2] G06F *3/02, 3/14*
U.S. Cl. 364—200 **5 Claims**

1. A program reminder system for entering, storing and displaying formated messages for subsequent reference including in combination:

display means for displaying messages having a predetermined format;

storage means for storing at least predetermined portions of said messages;

variable data entry means for entering variable data into the system, said variable data entry means including a data entry keyboard having a plurality of keys for entering data and a first random access memory for temporarily storing data entered by operation of at least some of said keys of said entry keyboard;

control means connecting said storage means and said variable data entry means with said display means; and

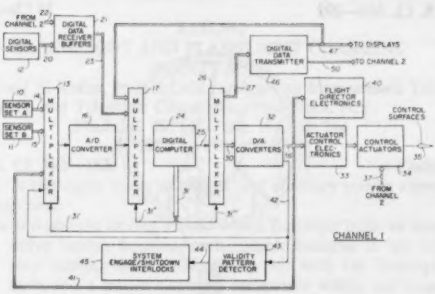
programmable operating means having an operating program and coupled with said control means for operating said control means to effect display of said predetermined portions of said messages and said variable data on said display means in an array of message portions corresponding to the program of said operating means.

4,115,847

AUTOMATIC FLIGHT CONTROL SYSTEM WITH OPERATIVELY MONITORED DIGITAL COMPUTER

Stephen S. Osder, Scottsdale, and David C. Mossman, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 485,862, Jul. 5, 1974, abandoned. This application Jan. 3, 1977, Ser. No. 756,467
Int. Cl.[2] G06F *15/50*; G05B *1/00*
U.S. Cl. 364—101 **25 Claims**



1. An automatic flight control system for aircraft having aerodynamic control surfaces and associated servo means coupled therewith for positioning said control surfaces and having sensor means for providing sensor signals in accor-

dance with flight conditions experienced by said aircraft, comprising

digital computer means having computer input means responsive to said sensor signals, program memory means, a repertoire of instructions operative in said flight control system and computer output means,

computer input coupling means for coupling said sensor means to said computer input means,

said computer means having a program stored in said program memory means comprising a plurality of first program segments structured for sequential execution by said computer means for controlling said computer means to operate on said sensor signals by sequentially performing a plurality of tasks respectively, to provide surface command signals to said computer output means,

said program further including a plurality of second program segments associated with said first program segments, respectively, for switching task completion indicia in said computer means to a set state in accordance with completion of said tasks, respectively,

said program further including a third program segment for testing said indicia for said set state thereby testing said indicia for completion of said tasks,

said program utilizing all of said instructions of said repertoire within at least one of said first, second and third program segments in a manner to cause at least one of said indicia to remain unset upon failure of an instruction to function properly,

said program further including a failure program segment that is entered from said third program segment when one of said indicia remains unset, said failure program segment including instructions for stopping the execution of said program,

means for controlling repeated executions of said program,

said program further including a fourth program segment for generating a precisely defined dynamically varying validity pattern by controlling a validity pattern signal at said computer output means to exhibit one level during an execution of said program and a different level during a subsequent execution thereof,

validity pattern detector means coupled to said computer output means to receive said validity pattern signal for detecting said validity pattern signal being in a state different from said precisely defined state during a time interval in which said repeated executions of said program would normally provide said precisely defined dynamically varying validity pattern signal and for providing a failure signal in accordance therewith, and

computer output coupling means said computer output means to said surface servo means for providing said surface command signals thereto.

4,115,848

METHOD AND SYSTEM OF CONTROLLING PLANTS

Yoichi Kogure, Tama; Toshimi Minoura, Fuchu, and Toshio Fujiwara, Inagi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 11, 1975, Ser. No. 639,980
Int. Cl.[2] G05B *15/02*
U.S. Cl. 364—107 **8 Claims**

1. In a method of controlling the operation of a plant by means of an electronic computer including memory means of the type wherein a process signal corresponding to the operation state of the plant is generated, the process signal being compared with a predetermined reference signal and the plant being controlled by the result of the comparison, the improvement which comprises the steps of

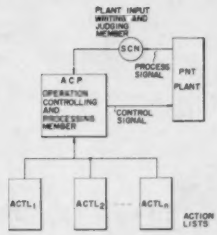
predetermining the judging conditions of the plant states and control and supervisory operations corresponding to respective judging conditions in the form of tables,

preparing a plurality of action lists having a standard form of plant state judging conditions plus controlling and supervisory operations,

storing the contents of respective action lists in memory means of said computer,

sampling said process signal,

comparing said sampled process signal with a reference signal for producing a trigger signal



selecting an action list corresponding to said process signal in accordance with said trigger signal,

judging the content of the selected action list for producing a control signal, and

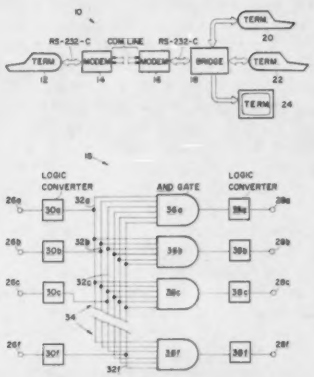
controlling said plant in accordance with said control signal.

4,115,849

DATA INTERFACE BRIDGE

Bill E. Johnson, and John E. Dannenmann, Jr., both of Portland, Oreg., assignors to Bejed, Inc., Portland, Oreg.

Filed Jan. 27, 1977, Ser. No. 762,999
Int. Cl.[2] H04Q *3/64*; H03K *17/00*
U.S. Cl. 340—147 CV **10 Claims**



1. A multiport bridge for interconnecting data terminal and data communication equipment in a serial binary data communication system, said bridge having at least three equipment interface ports, comprising

a multipin electrical connector for each port, each such connector having a data input pin and a separate data output pin, and

circuit means operatively interconnecting said input and output pins for transmitting a data signal received at any port's data input pin simultaneously to all of the other port's data output pins, said circuit means including

a multiconductor bus having an individual binary input signal line for each port,

means electrically connecting each data input pin to a corresponding input signal line in the bus, and

a plurality of multiple input logic circuits, one associated with each port for transmitting binary input signals from the bus to the data output pin of the associated port, the different inputs of each said logic circuit being individually connected to the different input signal lines in the bus,

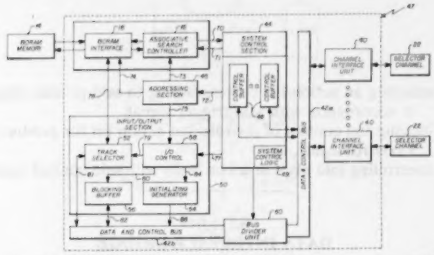
with the output of each circuit being connected to the associated port's output pin.

4,115,850

APPARATUS FOR PERFORMING AUXILIARY MANAGEMENT FUNCTIONS IN AN ASSOCIATIVE MEMORY DEVICE

George B. Houston, 742 Boylston Ave. E., Seattle, Wash. 98102, and Roger H. Simonsen, 26840-8th Ave. S., Kent, Wash. 98031

Filed Nov. 3, 1976, Ser. No. 738,570
Int. Cl.[2] G06F *7/00*
U.S. Cl. 364—200 10 Claims



1. An apparatus for performing data management functions for a data search device which is responsive to a search specification originated by a digital computer to search data that is stored in a memory which is peripheral to the digital computer, wherein the data in the peripheral memory is stored in a first data format of tracks of data which comprise successive data sectors, which are the smallest addressable groups of data in the peripheral memory, said apparatus comprising:

(a) means for receiving from the digital computer a data management request containing at least one of the following: (1) a search specification, and (2) data which is to be stored in the peripheral memory, wherein the data received from the digital computer is in a second data format of a series of logical records, wherein said receiving means includes means for temporarily storing the data management request;

(b) first connecting means for passing the search specification to the data search device;

(c) means for storing the address of the location of a particular sector of data in the peripheral memory containing a particular logical record found by the data search device to satisfy the search specification;

(d) means for retrieving data from, and writing data into, the peripheral memory in the first data format, including means responsive to said address storing means for retrieving the particular data sector from the peripheral memory which contains the particular logical record;

(e) means for reformatting data originally in the first data format into the second data format, and for reformatting data originally in the second data format into the first data format, including means for extracting the particular logical record from the remainder of the particular sector of data;

(f) second connecting means for passing data in the first data format between said reformatting means and said data retrieving and writing means;

(g) third connecting means for passing the data which has been received in said receiving means from the digital computer to said reformatting means; and

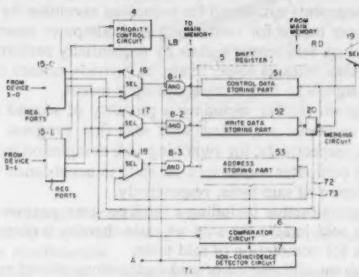
(h) fourth connecting means for passing the particular logical record from said reformatting means to said receiving means, from where it is passed to the digital computer in satisfaction of the search specification.

4,115,851

MEMORY ACCESS CONTROL SYSTEM

Genzo Nagano, Yokohama; Hiroshi Nakamura, Kawasaki, and Yukio Sohma, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 6, 1977, Ser. No. 785,104
Claims priority, application Japan, Apr. 24, 1976, 51/47039
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 12 Claims



1. A memory access control system for controlling access by at least one accessing device of a main memory of a given cycle time in accordance with a clock signal, and which includes a plurality of independently accessible logical storages, said memory access control system comprising:

means for receiving, from said at least one accessing device, a request for access to one of said logical storages designated by a given address;

means for receiving address information of those logical storages which are busy being accessed;

shift register means including a plurality of register stages corresponding in number to the given cycle time of the main memory for storing said address information those logical storages which are busy being accessed and for sequentially shifting the stored content in synchronism with said clock signal; and

comparator circuit means for comparing the content of each stage of the shift register means with said given address of the logical storage designated by the access request from the accessing device, and responsive thereto, when there is no coincidence between the content of each stage of the shift register means and said given address, to generate a control signal for accessing the designated logical storage.

4,115,852

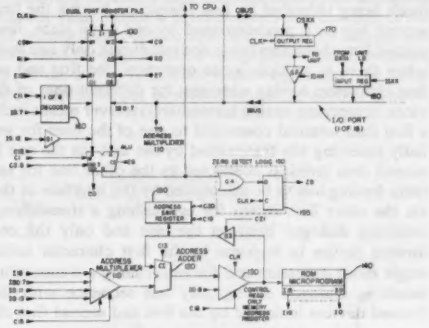
MICROPROGRAMMED CONTROLLER

James O. Rozell, Richardson, Tex., assignor to Harris Data Communications, Inc., Dallas, Tex.

Filed Dec. 7, 1976, Ser. No. 748,179
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 28 Claims

1. A controller circuit for connection to a central processor unit and at least one peripheral unit for controlling the transfer of data therebetween in response to instructions from the central processor unit comprising memory means for storing a plurality of microprograms each consisting of a plurality of microinstruction signals, address means responsive to instructions from said central processing unit for reading out selected microprograms from said memory means, at least one input-output port including input register means for storing data from said peripheral unit and output register means for storing data to be outputted to said peripheral unit, arithmetic means for performing arithmetic and logic functions, first bus means for connecting said input register means to a first input of said arithmetic means, second bus means for connecting the output of said arithmetic means to said output register means, feedback control means for selectively connecting the output of said output register means to said first bus means so as to feed

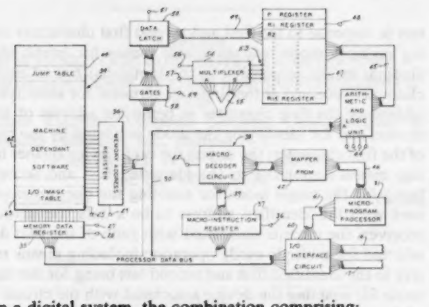
the data being applied to said peripheral unit directly back to said arithmetic means for further processing, said central processor unit being connected to said first and second bus means, and logic control means responsive to selected microinstruction signals from said memory means for providing a plurality of control signals for controlling the operation of said arithmetic means, said input register and output register means, said feedback control means, and said address means.



4,115,853
JUMP STRUCTURE FOR A DIGITAL CONTROL SYSTEM

Ernst H. Dummermuth, Chesterland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Dec. 21, 1976, Ser. No. 752,849
Int. Cl.[2] G06F 9/06
U.S. Cl. 364—200 **7 Claims**

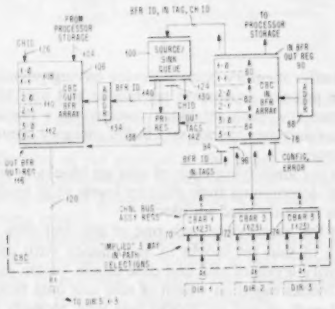


1. In a digital system, the combination comprising:
memory means for storing at successive memory addresses a set of control instructions;
memory address means coupled to said memory means and being operable to selectively address one of said control instructions;
jump table storage means for storing a plurality of selectable target memory addresses, each at a separate storage location;
first means coupled to said memory means for reading addressed control instructions from said memory means;
second means coupled to said first means and said jump table storage means for selecting one of said stored target memory addresses in response to a selected code in one of said control instructions;
third means coupled to said jump table storage means and said memory address means for loading a selected target memory address into said memory address means; and
fourth means coupled to said memory means, said memory address means and said jump table storage means and being operable in response to another selected code in another selected one of said control instructions read from said memory means to load a memory address from said memory address means into a selected location in said jump table storage means.

4,115,854
CHANNEL BUS CONTROLLER

Robert S. Capowski, Verbank; Lewis W. Wright, Hopewell Junction, and Terrence K. Zimmerman, Red Hook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,895
Int. Cl.[2] G06F 9/00
U.S. Cl. 364—200 **12 Claims**

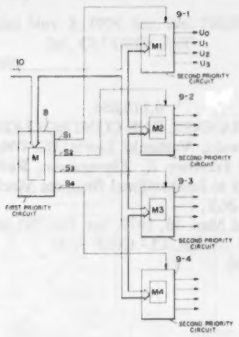


1. In a data processing system having a channel bus controller for transferring request information entities from multiple input/output channels to a shared processor store and for transferring response information entities associated with said request entities from said store to said channels, wherein said controller includes an input buffer having multiple positionally ordered spaces for storing said request entities in transit from said channels to said store, and an output buffer having multiple spaces corresponding to said input buffer spaces for storing said response entities in transit from said store to said channels, in combination:
means associated with said input buffer for providing tag entities in association with transfers of individual said request entities to said input buffer, said tag entities denoting the sequence of entry of the associated request entities into said input buffer;
means coupled to said input buffer for applying said request entities to said store in a sequence susceptible of differing from the sequence of entry of said request entities into said input buffer;
buffer means for retaining said tag entities after respective said request entities have been removed from said input buffer and applied to said store; and
means associated with said tag entity retaining means for utilizing said retained tag entities to order the sequence of transfers of said response entities from said output buffer to said channels in correspondence with the sequence of entry of the associated request entities into said input buffer.

4,115,855
BUFFER MEMORY CONTROL DEVICE HAVING PRIORITY CONTROL UNITS FOR PRIORITY PROCESSING SET BLOCKS AND UNIT BLOCKS IN A BUFFER MEMORY

Takashi Chiba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 19, 1976, Ser. No. 715,862
Claims priority, application Japan, Aug. 22, 1975, 50-101750
Int. Cl.[2] G06F *7/00, 13/00*
U.S. Cl. 364—200 **11 Claims**



1. A buffer memory control device having priority control units for priority processing set blocks and unit blocks in a buffer memory, each set block comprising a predetermined number of unit data blocks, said buffer memory control device comprising:

means for identifying each of said set blocks in accordance with determining their priority levels so as to designate a least recently used set block;

means for identifying each one of the unit data blocks of each of said set blocks in accordance with determining priority levels of said unit data blocks within each of said set blocks based on which of said unit data blocks within said each of said set blocks was least recently used, said priority levels of said unit data blocks being determined simultaneously with the identifying of said set blocks; and

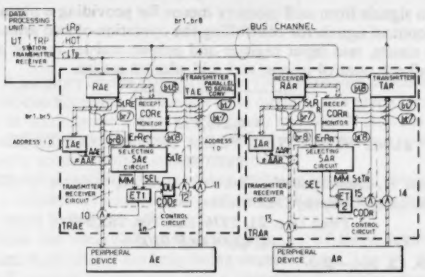
means for extracting one unit data block by a combination of identifying the least recently used set block and the least recently used unit data block from each set block.

4,115,856
INTERFACES FOR CONNECTING A DATA-PROCESSING UNIT TO A WORKING STATION

Gerard François Labeye-Voisin, Ste Gemmes sur Loire, and Claude Hostein, Avrille, both of France, assignors to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Nov. 26, 1976, Ser. No. 745,237
Claims priority, application France, Nov. 27, 1975, 75 36385
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **19 Claims**

1. An interface for connecting a data processing unit to data transmitting and receiving devices; the interface including a transmitter/receiver circuit connected to the unit and transmitter/receiver circuit means associated with the devices; the unit transmitter/receiver circuit being connected to transmitter/receiver circuit means for the devices by two signal transmission lines in a channel which exchanges data between the unit and the devices, character by character, by sequentially transmitting bits of each character; a dialoguing sequence between the unit and one of the devices being initiated by a first character containing an address associated with the one device; first first characters indicating single mode operation whereby the unit and only one of the devices are interconnected to exchange data, second first characters indicating multiple mode operation whereby two of the devices are interconnected via the lines and the unit, the single mode being identified by first characters having first and second bits in a predetermined first logic state, the single mode first characters including additional bits for indicating an address of the one device; the multiple mode being identified by first characters having the first and second bits in a predetermined second logic state, first and second first characters being derived during only one sequence when there is multiple mode operation, the first and second first characters having addresses for different ones of the devices; comprising station transmitter/receiver means including a first data terminal connected to one of the lines for sequentially receiving bits transmitted by the unit via the one line, a second data terminal connected to the other line for sequentially feeding bits to be transmitted by the interface to the unit via the other line, means for establishing a transmitting and receiving dialogue between the unit and only the one addressed device in response to the first character indicating single mode operation and for establishing a transmitting and receiving dialogue during only one sequence with the addressed devices indicated by the first and second first characters in response to the first and second first characters indicating multiple mode operation; said means for establishing including: means responsive to the sequential bits of each first character received at the first data terminal for identifying the address of the first character as being the address of the one device, and for identifying the mode indicated by the two bits of the first character; the circuit for each device further including: means responsive to the identified first and second bits being for the single mode for enabling the one device associated with the identified address to be a data transmitter and receiver; the circuits associated with each of the two devices selected for multiple mode operation including means responsive to the identified first and second bits being for the multiple mode for enabling the device associated with the circuit at one of the two identified addresses to dialogue with the unit during the same sequence, one of the two devices being activated as a data transmitter and the other of the two devices being activated as a data receiver in the multiple mode; the station transmitter/receiver means including means for feeding to the second data terminal sequential bits derived in the interface in response to signals derived by a device connected to the interface.



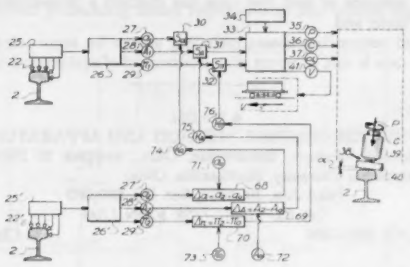
4,115,857
PROCESS AND APPARATUS FOR ON-TRACK TRUING OF THE HEADS OF RAILS OF A RAILWAY

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,431
Claims priority, application Switzerland, Feb. 18, 1976, 1961/76
Int. Cl.[2] G06F *15/46*; B24B *49/10*
U.S. Cl. 364—474 **12 Claims**

7. In apparatus for on-track truing of the surface of the head of rails of a railway comprising at least one grinding vehicle

including a pre-determined number of tools for truing the head of the rails, a feed and control circuit connected to said tools and comprising means for controlling the value of at least one parameter depending from said circuit and influencing the metal-removing capability of at least one truing tool according to a control value which is preestablished as a function of the desired cutting depth of said tool, and means for setting said control value, the improvement comprising means positioned in front of the truing vehicle for measuring at least one of (a) the mean amplitude (a_1) of undulatory deformations of short



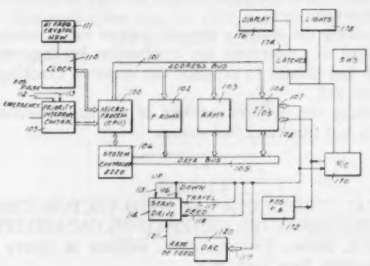
wavelength, (b) the amplitude (A_1) of undulatory deformations of long wavelength, and (C) the amplitude (π_1) of defects in the profile of the head of the rails and for generating an output signal representative of the value of said amplitude, means for setting said value of the amplitude, and means for setting known values corresponding to the metal-removing capability of the tool in question, the control value of the selected parameter to obtain the cutting depth desired and/or the position of said tool being determined as a function of the value of the amplitude set and of the metal-removing capability values set.

4,115,858

MACHINE TOOL CONTROLLER EMPLOYING MICROPROCESSOR SYSTEM FOR CONTROLLING Z AXIS

Menachen Kaufman, Hawaiian Gardens, Calif., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,299
Int. Cl.[2] G05B *19/18*
U.S. Cl. 364—474 **24 Claims**



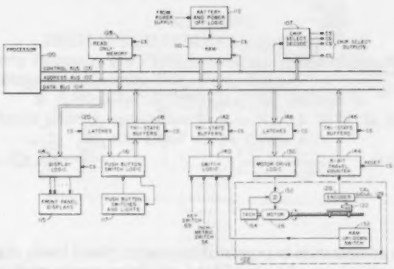
1. In a machine tool having motion control means for controlling two axes of movement of said machine tool, a controller separate from said motion control means adapted to control a third axis of operation of a machine tool, said third axis being aligned with the axis of a tool supporting spindle, said controller comprising a microprocessor dedicated to said axis, a memory unit associated with said microprocessor, an input/output control unit associated with said microprocessor and a control panel incorporating a keyboard connected with said input/output control unit, said panel incorporating a display unit for displaying data supplied to or from said input/output control unit, said memory unit having a plurality of storage locations for storing data associated with different operations of said machine tool relative to said third axis, and said keyboard being operative to permit entry of said data into said memory unit, via said input/output control unit.

4,115,859

BACK GAUGE CONTROLLER

Richard A. Brisk, Wayland, and David E. Miller, Beverly, both of Mass., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Jun. 30, 1977, Ser. No. 811,908
Int. Cl.[2] G06F *15/46;* B21D *5/00*
U.S. Cl. 364—476 **22 Claims**



1. For use in a gauging system for a forming machine having a forming tool, a gauge bar movable along a travel path toward and away from said forming tool, and an encoder providing a signal indication of the position of the gauge bar along said travel path, a programmable, digital controller comprising:

a pre-programmed processor having a plurality of stored operating modes;

a plurality of manually operable mode controls for selecting respective operating modes stored in said processor;

a plurality of manually operable data select controls for selection of respective gauge parameters;

keyboard means manually operable for entry of numerical data associated with said data select controls;

memory means for storing data entered by said data select controls and keyboard means, representing a sequence of steps, each having a plurality of associated gauge parameters;

said processor including means for sequentially accessing the data represenative of each step of a sequence of steps stored in said memory means;

means operative in response to signals from said encoder to provide data to said processor representative of the position of said gauge bar along said travel path; and

drive logic means, operative in response to data from said processor during selected ones of said modes, for causing movement of said gauge bar to an intended position specified by the data representative of the gauge parameters associated with the step presently accessed by said processor;

the controller further including:

means operative during a first mode for displaying the gauge parameter associated with each step as said processor sequentially accesses the data representative of each step, without causing said drive logic means to move said gauge bar;

means operative during a second mode for enabling said drive logic means to move said gauge bar to the intended position associated with each step as the processor sequentially accesses the data representative of each step, without requiring actuation of the forming machine; and

means operative during a third mode for automatically causing said drive logic means to automatically move

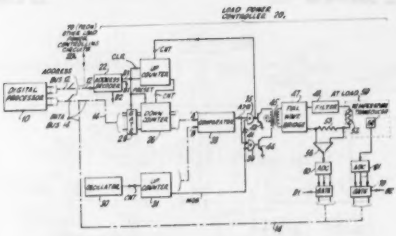
said gauge bar, following each actuation of the forming machine, to the intended position associated with each step as the processor sequentially accesses the data representative of each step.

4,115,860

PLURAL LOAD POWER CONTROLLER WITH TIME-SHARED PROCESSOR

Jerrold Bradford Atwater, North Plainfield, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Jun. 2, 1977, Ser. No. 802,965
Int. Cl.[2] H02J *1/00*; G06F *15/20*
U.S. Cl. 364—492 **9 Claims**



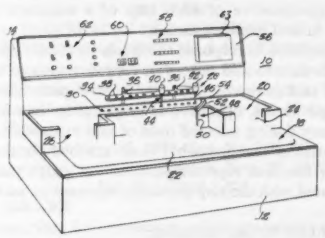
1. In combination in regulator apparatus, plural loads, digital processor means, and plural load regulator means each connected between said processor means and a different one of said loads, each of said plural load regulator means including binary wind registering means, means for loading said word registering means with an output from said digital processor means, variable duty factor means connected to and responsive to said binary word registering means for supplying an output control wave of varying duty factor, and gated load energizing means having a gate control port connected to the output of said variable duty factor means.

4,115,861

CHEMICAL ANALYZER

Robert William Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 28, 1977, Ser. No. 781,768
Int. Cl.[2] G06F *15/20*; G01N *33/16*
U.S. Cl. 364—497 **19 Claims**



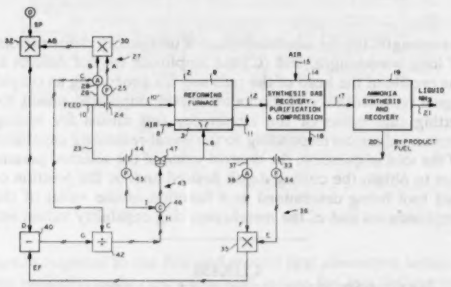
1. Automatic apparatus comprising:
at least one actuator of a first type having first and second discrete states;
at least one actuator of a second type controllable across a range of states;
means adapted to replaceably hold a program;
said program having first and second types of instructions;
said first type of instruction including a command and said second type of instruction including a command and data;
sequencing means for sequencing to different instructions of said program;
first execution means connected to receive said first type of instructions for energizing actuators of said first type having first and second discrete states in response to said first instruction;
second execution means connected to receive said steps instructions of said second type for energizing actuators of said second type controllable across a range of states;
data means for controlling the particular state in said range of states of said actuators of said second type in response to said data; and
time delay means for delaying sequencing of said sequencing means after an instruction of said first type until said actuator of said first type has reached a predetermined state; and
said sequencing means including means for sequencing to data in said program after a command of said second type.

4,115,862

PROCESS CONTROL METHOD AND APPARATUS

William S. Stewart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 20, 1977, Ser. No. 808,000
Int. Cl.[2] G06G *7/58*; F23N *1/00*
U.S. Cl. 364—500 **12 Claims**



7. A method for controlling thermal cracking of at least a portion of a feed hydrocarbon stream wherein heat is supplied for cracking by the combustion of a fuel stream and a supplemental fuel stream, said method including the steps of:
measuring the cracking heat input per unit time requirement for a predetermined level of cracking of said portion of the feed hydrocarbon stream;
measuring the combustion heating value per unit time of the fuel stream;
determining the quantity per unit time of supplemental fuel needed to supplement the combustion heating value of said fuel stream to produce the required cracking heat input; and
combining the required amount of the supplemental fuel with fuel from said fuel stream.

4,115,863

DIGITAL STROKE DISPLAY WITH VECTOR, CIRCLE AND CHARACTER GENERATION CAPABILITY

Richard R. Brown, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,357
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—521 **49 Claims**

1. Digital stroke display apparatus having display tube means with a display face and writing means positionable along X and Y display axes for writing vectors with predetermined slopes and circular curves comprising a series of concatenated vectors on said display face comprising
a source of clock pulses,
first counter means coupled to receive said clock pulses for counting said clock pulses and providing a first digital count signal in accordance therewith,

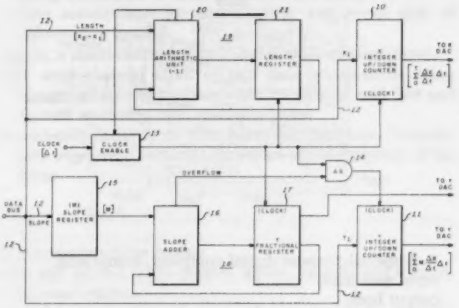
first positioning means responsive to said first digital count signal and coupled to said writing means for positioning said writing means along one of said axes in accordance with said first digital count signal at a first rate,

means for providing a slope signal representative of said slope,

multiplying means responsive to said clock pulses and to said slope signal for providing further clock pulses representative of the product therebetween,

second counter means for counting said futher clock pulses and providing a second digital count signal in accordance therewith,

second positioning means responsive to said second digital



count signal and coupled to said writing means for positioning said writing means along the other of said axes in accordance with said second digital count signal at a rate proportional to the product of said slope and said first rate,

said means for providing a slope signal including slope memory means for storing a plurality of slope values corresponding to said series of concatenated vectors respectively, and

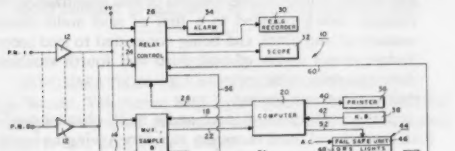
slope memory addressing means coupled to said slope memory means for addressing said plurality of slope values to provide said slope signal to said multiplying means in accordance therewith, thereby writing said circular curves.

4,115,864

FAIL SAFE DETECTOR IN A CARDIAC MONITOR

Howard Andrew Vick, Pearland, and Donald B. Johnson, Houston, both of Tex., assignors to Hycel, Inc., Houston, Tex.

Continuation of Ser. No. 515,107, Oct. 31, 1974, abandoned.
This application Apr. 27, 1977, Ser. No. 791,559
Int. Cl.[2] G08B *21/00*
U.S. Cl. 364—550 **6 Claims**



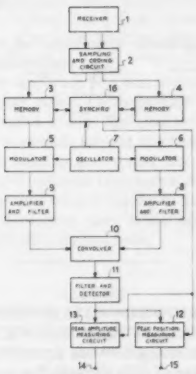
1. In an electrocardiac waveform monitoring apparatus for monitoring at least one source of cardiac waveforms and including a failsafe unit for producing an alarm signal in the absence of reset signals applied thereto, computer means coupled to said failsafe unit for supplying reset signals to said failsafe unit, and means for triggering said computer means periodically in response to processing of periodically produced cardiac waveforms to produce a reset signal periodically, the computer means being responsive to each said source for providing a signal indicative of the absence of a cardiac waveform applied from each said source when no waveforms are applied therefrom, and wherein said computer means comprises means for responding to said signal indicative of the absence of a cardiac waveform from each said source to trigger periodically production of a reset signal, whereby a false alarm condition is prevented when said electrocardiac waveform monitoring apparatus is operative to process waveforms and no cardiac waveforms are received thereby for processing.

4,115,865

HIGH-SPEED CORRELATING DEVICE

Thierry Beauvais, and Philippe Souchay, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 6, 1977, Ser. No. 785,300
Claims priority, application France, Apr. 9, 1976, 76 10564
Int. Cl.[2] G06F *15/34;* G06G *7/19*
U.S. Cl. 364—604 **9 Claims**



1. A high-speed correlating device for delivering an output correlation signal which is the result of the correlation of two input signals in the form of successive samples, comprising:

at least a first and second memory for storing respectively samples of said two input signals;

a synchronizing circuit for controlling the read out from said first and second memory simultaneously with a time inversion for the read out of one of said first and second memories;

an oscillator for producing a carrier wave;

first amplitude modulating means for modulating the amplitude of said carrier wave by using the information read out from said first memory, said first amplitude modulating means delivering a first analogue signal reconstituted in the form of a modulation of the amplitude of the carrier wave;

second amplitude modulating means for modulating the amplitude of said carrier wave by using the information read out from said second memory, said second amplitude modulating means delivering a second analogue signal reconstituted in the form of a modulation of the amplitude of the carrier wave;

an electroacoustical convolver device for receiving the respective first and second analogue signals; and

means for filtering and detecting the modulation of the output signal from the convolver and delivering said output correlation signal.

4,115,866

DATA PROCESSING NETWORK FOR COMMUNICATIONS SWITCHING SYSTEM

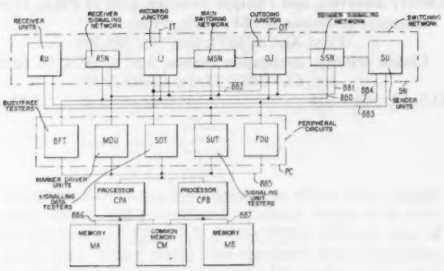
Juliaan Leo Gerard Janssens, Olmen, and Marie Jeanne Françoise Louise Ghislaine Malherbe, Berchem, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 335,683, Feb. 26, 1973. This application May 7, 1976, Ser. No. 684,422

Claims priority, application Netherlands, Feb. 25, 1972, 7202503

Int. Cl.[2] G06F *1/00*

U.S. Cl. 364—900 4 Claims



1. An automatic communications switching system comprising a switching network for completing calls through the system, a data processing network for controlling the completion and supervision of calls through the system by the execution of programs, and a plurality of peripheral circuits interfacing between said switching network and data processing network to provide signals regarding the condition of the switching network to the processing network and for transmitting signals from the processing network for controlling and supervising the operation of the switching network, and in which said data processing network includes a first and a second processor, a first individual memory normally accessible only to the first processor for storing data including programs of a first set concerning calls being handled by said first processor, a second individual memory normally accessible only to the second processor for storing data including programs of said first set concerning calls being handled by said second processor, means in individual memories for storing address information of calls through peripheral circuits, the calls being handled by the processor associated with the respective individual memory, a further memory commonly accessible from both said first and said second processor for storing data representing conditions of said peripheral circuits being completed through said peripheral circuits under the control of both said processors in a load sharing manner and, in which each of said processors includes means to prevent said programs of said second set from being simultaneously executed by both processors to thereby give rise to conflicting situations due to the simultaneous handling of similar programs, said preventing means comprising a storage table individual to each processor, said table indicating the programs to be handled and not to be handled by the particular processor.

4,115,867

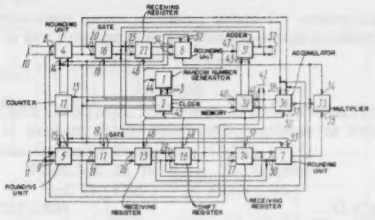
SPECIAL-PURPOSE DIGITAL COMPUTER FOR COMPUTING STATISTICAL CHARACTERISTICS OF RANDOM PROCESSES

Evgeny Evgenievich Vladimirov, ulitsa Yaroslava Gasheka, 2, kv. 1; Vladimir Gerasimovich Korchagin, prospekt Veteranov, 144/21, kv. 202; Jury Borisovich Sadomov, ulitsa Tipanova, 2, kv. 17, and Lev Mikhailovich Khokhlov, ulitsa Gertsena, 47, kv. 10, all of Leningrad, U.S.S.R.

Filed Jul. 5, 1977, Ser. No. 813,162

Int. Cl.[2] G06F *7/00, 15/06, 15/36*

U.S. Cl. 364—900 2 Claims



1. A special-purpose digital computer, comprising:
input data lines;
output lines;
a random-number generator for producing a uniform pseudo-random number sequence having
an input and a multi-channel output;
a clock having
an input, a multi-channel input, outputs and multi-channel outputs,
said multi-channel input of said clock being connected to said multi-channel output of said random-number generator;
a quantization step counter for determining the value of a quantization amplitude interval having
an input and first and second multi-channel outputs,
said input of said quantization step counter being connected to a first of said outputs of said clock; first, second, third and fourth stochastic data rounding units for linear conversion of the code into its probability and for stochastic rounding of numbers having
first and second multi-channel inputs and a multi-channel output,
said first multi-channel inputs of said first and said second rounding units being connected to said input data lines,
said second multi-channel inputs of said first and second stochastic data rounding units being connected to said first and second multi-channel outputs of said quantization step counter, being coupled to a first of said multi-channel outputs of said clock and being connected to said second multi-channel inputs of said third and fourth stochastic data rounding units;
a shift register unit having
an input, a multi-channel input and a multi-channel output;
first, second and third receiving registers having an input, a multi-channel input and a multi-channel output,
said multi-channel output of said first receiving register being connected to said first multi-channel input of said third stochastic data rounding units,
said multi-channel input of said third receiving register being interconnected with said multi-channel input of said first receiving register, being coupled to said multi-channel output of said shift register unit and being connected to said multi-channel input of said shift register unit, to said multi-channel outputs of said second and third receiving register and to said first multi-channel input of said fourth stochastic data round-off unit;
first and second gate units having
an input, a multi-channel input and a multi-channel output,

said multi-channel inputs of said first and second receiving registers being connected to said multi-channel outputs of said first and second gate units, respectively;

said multi-channel inputs of said first and second gate units being connected to multi-channel outputs of said first and second stochastic data rounding units, respectively,

said inputs of said gate units being connected to respective outputs of said clock;

an adder having an input, a multi-channel input and multi-channel output,

said multi-channel output of said adder being connected to said multi-channel input of said first receiving register and being connected to some of said output lines;

a data accumulator for accumulation and group shift of information having

inputs, a multi-channel output and a multi-channel input,

said multi-channel input of said data accumulator being connected to said multi-channel outputs of said first and second stochastic data rounding units;

a read-only memory to store harmonic functions, "correlation window" functions, the values of the functions of the form

$$\eta = -P \log_2 P,$$

and microinstructions having

first and second multi-channel inputs, outputs and a multi-channel output,

said first multi-channel input of said read-only memory being connected to a second of said multi-channel outputs of said clock,

said outputs of said read-only memory being connected to said inputs of said random-number generator, said clock, said first, second and third receiving registers, said adder, and said shift register unit and to a first of said inputs of said data accumulator,

said multi-channel output of said read-only memory being connected to said multi-channel input of said adder,

said second multi-channel input of said read-only memory being connected to said multi-channel output of said data accumulator and being coupled to other of said output lines and to said first multi-channel inputs of said first and second stochastic data rounding units; and

a single-time step multiplier for stochastic multiplication of numbers having

inputs and an output,

said inputs of said multiplier being connected, respectively, to outputs of said third and fourth stochastic data rounding units, and

said output of said multiplier being connected to said outputs of said third and fourth stochastic data rounding units and being coupled to said input of said data accumulator.

4,115,868

INFORMATION TRANSFERRING APPARATUS

Seigo Suzuki, Yokohama; Seiji Eguchi, Kawasaki, and Yoshiaki Moriya, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 732,703

Claims priority, application Japan, Oct. 15, 1975, 50-124140

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—900 **4 Claims**

1. An information transferring apparatus disposed between first and second information processing units comprising:

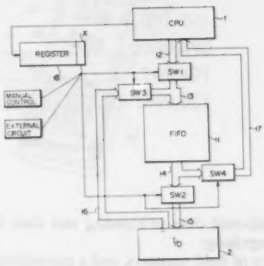
a first-in first-out stack having an input terminal and an output terminal;

a first information line connected between the first information processing unit and said input terminal for transferring information from said first information processing unit to said first-in first-out stack;

a second information line connected between said output terminal and the second information processing unit for transferring information from said first-in first-out stack to said second information processing unit;

a third information line connected between the second information processing unit and said input terminal for transferring information from said second information processing unit to said first-in first-out stack;

a fourth information line connected between said output terminal and the first information processing unit for transferring information from said first-in first-out stack to said first information processing unit;



switching means for selectively deactivating said first to fourth information lines; and

control means for applying first and second control signals to said switching means, wherein said switching means operates responsive to the first control signal from said control means to deactivate said third and fourth information lines while holding active said first and second information lines, and operates responsive to the second control signal from said control means to deactivate said first and second information lines while holding active said third and fourth information lines.

4,115,869

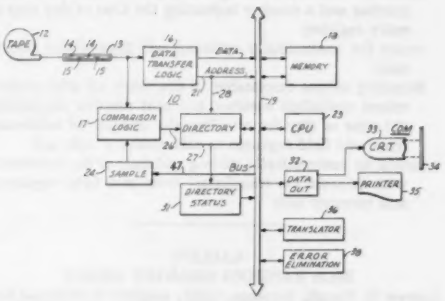
METHODS AND APPARATUS FOR PROCESSING DATA INCLUDING A CHARACTERISTIC MARK OR ERROR

Hubert P. Putnam, Orange, and William O. Butts, Irvine, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 12, 1976, Ser. No. 731,245

Int. Cl.[2] G06F *1/00*

U.S. Cl. 364—900 **33 Claims**



1. In a method of processing data including a recurring characteristic mark, the improvement comprising in combination the steps of:

storing said data at storage locations;

establishing a directory of specific locations of stored data including said characteristic mark;

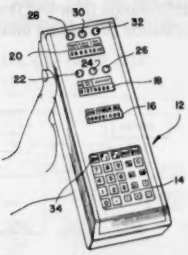
processing said stored data; and

controlling said processing with the aid of said directory.

4,115,870
HAND-HELD DATA PROCESSING TERMINAL

Arthur C. Lowell, Newport Beach, Calif., assignor to Wordsmith, Inc., Santa Monica, Calif.

Filed Nov. 18, 1976, Ser. No. 742,841
Int. Cl.[2] G07C 1/10; G06F 3/02
U.S. Cl. 364—900 13 Claims



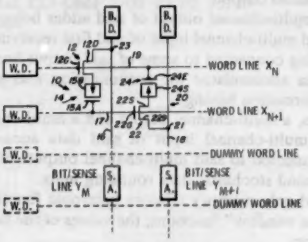
1. A hand-held data processing and data logging terminal system comprising:
- a plurality of field registers, and a corresponding plurality of associated visible display means for exhibiting the data included in each said field register;
- an entry register and a corresponding associated visible display means for exhibiting numbers included in said entry register; said entry register and associated visible display means being separate from said field registers and associated displays;
- a keyboard;
- means for entering data from said keyboard into said entry register, and concurrently displaying said data in said associated visible display;
- a plurality of individual switching means mounted on the face of said hand-held data processing system and adjacent each of said field registers for selectively shifting information from said entry register directly into the selected one of said field registers for immediate display in the visible display associated with each field register;
- housing means for mounting said registers, display means, keyboard, data shifting means and switching means into a lightweight hand-held unit;
- a memory unit;
- means for entering information stored in said field registers into said memory unit;
- means for initially entering a key predetermined multidigit number and a number indicating the time of day into said entry register;
- means for continuously updating said time of day information;
- decoding means responsive to the entry of said predetermined multidigit number and said number representing the time of day for enabling the transfer of information from said field registers to said memory unit; and
- means for automatically storing said time of day information with information transferred from said field registers to said memory unit.

4,115,871
MOS RANDOM MEMORY ARRAY

Andrew G. Varadi, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 19, 1977, Ser. No. 788,871
Int. Cl.[2] G11C 11/24, 7/02
U.S. Cl. 365—149 10 Claims

10. An MOS random access memory array comprising, in combination, a plurality of interconnected memory cells, means for writing information into said memory cells, means for reading information contained in said memory cells, each of said memory cells comprising an MOS device having source and drain regions and a gate electrode and a semiconductor capacitor device connected to said MOS device, said semiconductor capacitor device of each of said memory cells having an electrically conductive electrode as one plate of the semiconductor capacitor device, said electrically conductive electrode being connected to the gate electrode of another MOS device of one of said plurality of memory cells, said gate electrode of said MOS device being in electrical contact with an electrically conductive electrode plate of another semiconductor

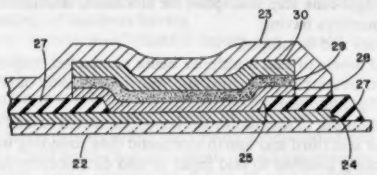


capacitor device coupled to said another MOS device, a plurality of word lines and a plurality of bit/sense lines, each of said memory cells being connected to two adjacent word lines and one bit/sense line, each one of said memory cells having an adjacent memory cell, said each one of said memory cells being connected to one of said plurality of bit/sense lines and said adjacent memory cell being connected to another of said plurality of bit/sense lines.

4,115,872
AMORPHOUS SEMICONDUCTOR MEMORY DEVICE FOR EMPLOYMENT IN AN ELECTRICALLY ALTERABLE READ-ONLY MEMORY

Vernon A. Bluhm, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 801,773
Int. Cl.[2] G11C 11/00
U.S. Cl. 365—163 10 Claims



1. An electrically alterable memory device comprising:
- a positive electrode;
- a negative electrode; and
- a structure of memory material mounted inbetween said electrodes, which structure is constructed of first, second and third regions, said first region being adjacent to said positive electrode, said third region being adjacent to said negative electrode, said second region being between said first and third regions;
- said second region being formed of a tellurium based chalcogenide which has higher electrical resistance in its amorphous state and lower electrical resistance in its crystalline state and can be switched from one state to the other upon application of said electrodes of an electrical signal of appropriate value;
- said first region being formed of a material having a higher percentage of tellurium than said second region;
- said third region being formed of material having a higher percentage of germanium than said second region.

DESIGN PATENTS

GRANTED SEP. 19, 1978

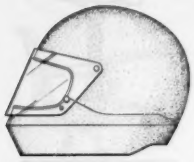
ERRATA

For CLASS	See PATENT NO.
D09–191	249,490
D09–219	249,491
D16–030	249,521

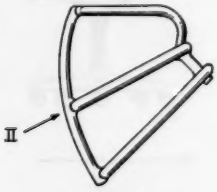
DESIGNS

SEPTEMBER 19, 1978

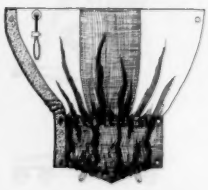
249,396
HELMET
Eitaro Kamata, Tokyo, Japan, assignor to ShoeiSafety Helmet Corporation, Los Angeles, Calif.
Filed Nov. 1, 1976, Ser. No. 737,680
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



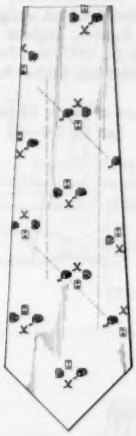
249,397
FACE GUARD FOR MOUNTING ON AN ATHLETIC HELMET
Delby C. Humphrey, Terre Haute, and Robert D. Humphrey, Litchfield, both of Ill., assignors to Schutt Manufacturing Company, Litchfield, Ill.
Filed Sep. 30, 1976, Ser. No. 728,394
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



249,398
PROTECTIVE GAITER FOR SNOW SKIERS
Scott Stewart, 901 Watson St., Madison, Wis. 53713
Filed Jun. 21, 1976, Ser. No. 697,836
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275



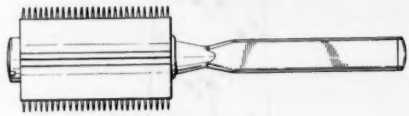
249,399
NECKTIE
John Joseph Knapman, Jays, 49A Cricketers Lane, Herongate, Brentwood, Essex CM13 3QB, England
Filed Sep. 22, 1976, Ser. No. 725,362
Claims priority, application United Kingdom, Mar. 29, 1976, 975100
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—357

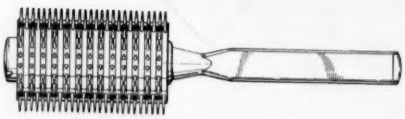


249,400
TOY BOXING GLOVE
Maxwell Pearson, Zionsville, Pa., assignor to Cartex Corporation, Doylestown, Pa.
Filed Aug. 11, 1976, Ser. No. 713,555
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

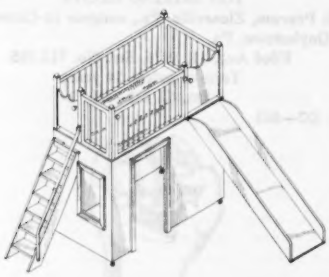
249,401
HAIRBRUSH
Myron Glasberg, Needham, Mass., assignor to Brynel Incorporated, Watertown, Mass.
Filed Jul. 29, 1977, Ser. No. 820,358
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

249,402
HAIRBRUSH
Harold Leighton, London, England, assignor to Harold Leighton (Products) Limited, London, England
Filed Jan. 17, 1977, Ser. No. 759,836
Claims priority, application United Kingdom, Jul. 16, 1976, 976538
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31





249,403
COMBINED CHILD'S BED AND AMUSEMENT CENTER
James M. Lamb, 2402 Nottingham Dr., Garland, Tex. 75040
Filed Jul. 13, 1976, Ser. No. 704,793
Term of patent 14 years
Int. Cl. D6—*01, 05*
U.S. Cl. D6—6



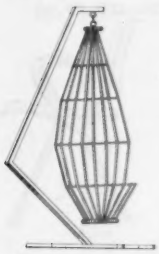
249,404
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,824
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

249,405
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,825
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

249,406
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,823
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

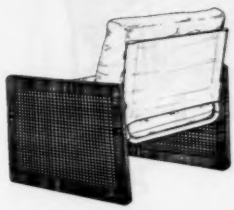
249,407
TABLET ARM CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,826
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—44

249,408
SUSPENSION CHAIR AND STAND
William P. Jackson, 431 Bonsall Ave., Yeadon, Pa. 19050
Filed Feb. 10, 1977, Ser. No. 767,266
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—54

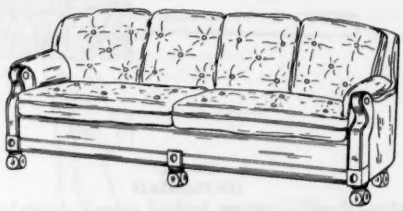


249,409
CHAIR
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Filed Mar. 15, 1976, Ser. No. 667,160
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

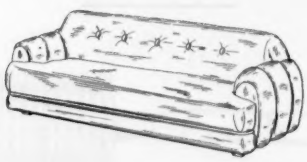
249,410
SEAT
Jan Dranger, and Johan Huldt, both of Stockholm, Sweden, assignors to Innovator Design AB, Stockholm, Sweden
Continuation of Ser. No. 730,253, Oct. 6, 1976, abandoned, which is a continuation of Ser. No. 695,550, Jun. 14, 1976, abandoned, which is a continuation of Ser. No. 695,548, Jun. 14, 1976, abandoned. This application Sep. 19, 1877, Ser. No. 834,757
Claims priority, application Sweden, Dec. 16, 1975, 752507; Jun. 4, 1976, 761225
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



249,411
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Jan. 24, 1977, Ser. No. 761,700
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



249,412
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Jan. 24, 1977, Ser. No. 761,699
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



249,413
CHAIR
James Frank, Hunters Hill, Australia, assignor to Framac Industries Pty. Limited, Granville, Australia
Filed Nov. 5, 1976, Ser. No. 739,231
Claims priority, application Australia, May 19, 1976, 69235
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

249,414
LOUNGE CHAIR, OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Jan. 12, 1977, Ser. No. 758,678
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

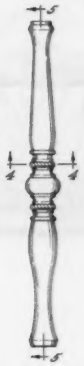
249,415
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,682
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

249,416
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Division of Ser. No. 692,899, Jun. 4, 1976. This application Aug. 11, 1977, Ser. No. 823,725
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

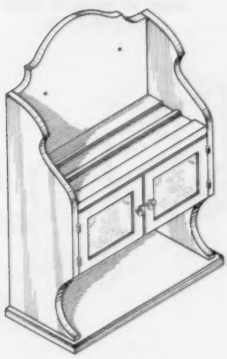
249,417
CHAIR
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Filed Jun. 4, 1976, Ser. No. 692,899
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

249,418
STEM FOR SUPPORTING A SOAP DISH OR THE LIKE
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,549
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86

249,419
STEM FOR SUPPORTING A TOWEL TREE OR THE LIKE
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,541
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—103



249,420
STONEWARE HUTCH CABINET
Maurice G. Mountain, and William S. Ripley, III, both of York, Pa., assignors to Susquehanna Broadcasting Co., York, Pa.
Filed Oct. 6, 1976, Ser. No. 730,244
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

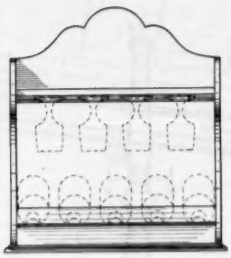


249,421

VINTNERS' BIN AND CABINET

Paul E. Helgesen, Seven Valleys; Maurice G. Mountain, and William S. Ripley, III, both of York, all of Pa., assignors to Susquehanna Broadcasting Co., York, Pa.

Filed Oct. 6, 1976, Ser. No. 730,245
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130

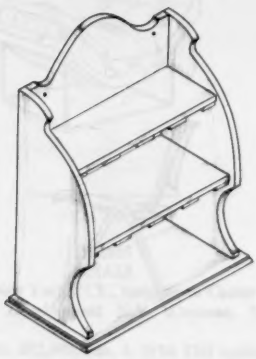


249,422

GLASSWARE HUTCH CABINET

Paul E. Helgesen, Seven Valleys, and William S. Ripley, III, York, both of Pa., assignors to Susquehanna Broadcasting Co., York, Pa.

Filed Oct. 6, 1976, Ser. No. 730,246
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—134

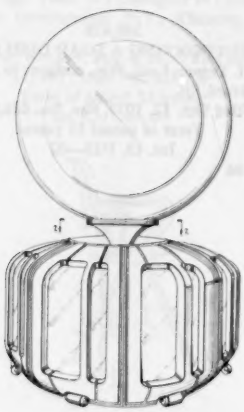


249,423

MOBILE DEVICE FOR THE DISPLAY OF ADVERTISING OR ENTERTAINMENT, OR FOR DISPENSING PRODUCTS

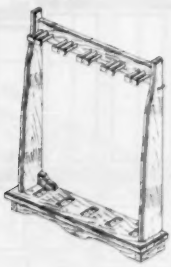
Kenneth H. Walker; Garfield Langworthy, both of New York, N.Y., and Robert L. Turner, Florham Park, N.J., assignors to Walker-Grad Inc.

Filed Apr. 27, 1976, Ser. No. 680,725
Term of patent 14 years
Int. Cl. D20—*02, 03*
U.S. Cl. D6—146



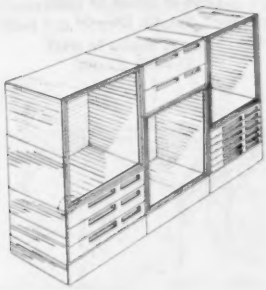
249,424
BUFFET AND CHINA DECK
James D. Brown, High Point, N.C., assignor to The Lane Company, Inc.
Filed Dec. 30, 1976, Ser. No. 758,546
Term of patent 3 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

249,425
SKI RACK
John A. Jones, 7820 Boulder Ave., Highland, Calif. 92346
Filed Jan. 24, 1977, Ser. No. 761,599
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

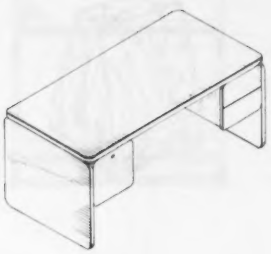


249,426
JEWELRY DISPLAY CASE
Harley West Parsons, 9005 Grandview, Arvada, Colo. 80002
Filed Mar. 2, 1977, Ser. No. 773,540
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—158

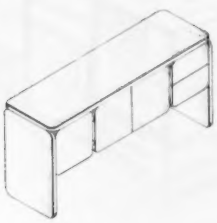
249,427
MODULAR STORAGE UNIT
Rene E. Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed Jun. 22, 1976, Ser. No. 698,759
Claims priority, application France, Dec. 31, 1975, 75 74450
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



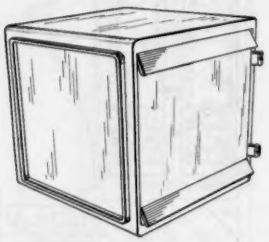
249,428
DESK
Fuller Robinson, Jalisco, Mexico, assignor to Standard Desk Limited
Division of Ser. No. 448,506, Mar. 6, 1974. This application Mar. 4, 1976, Ser. No. 663,998
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



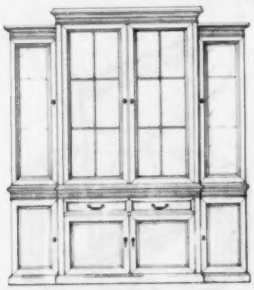
249,429
CREDENZA
Fuller Robinson, Jalisco, Mexico, assignor to Standard Desk Limited
Division of Ser. No. 448,506, Mar. 6, 1974. This application Mar. 4, 1976, Ser. No. 663,991
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



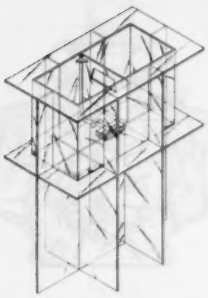
249,430
CABINET OR SIMILAR ARTICLE
Robert A. Chervenak, Seattle, Wash., assignor to Comerco, Inc., Tacoma, Wash.
Filed Nov. 8, 1976, Ser. No. 739,998
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



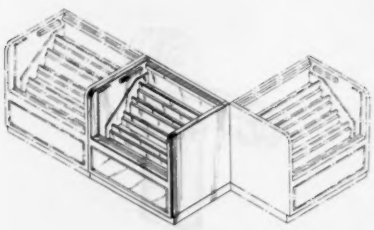
249,431
DINING ROOM BREAKFRONT, OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Jan. 12, 1977, Ser. No. 758,685
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



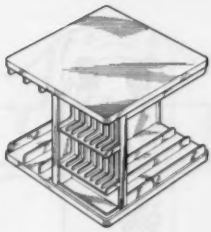
249,432
COMBINED PLANTER AND SUPPORT
Mary Ellen Pearce, and John Scott Pearce, both of 8800 Burbank Rd., Annandale, Va. 22003
Filed Dec. 22, 1975, Ser. No. 643,232
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02;* D30—*02*
U.S. Cl. D6—183



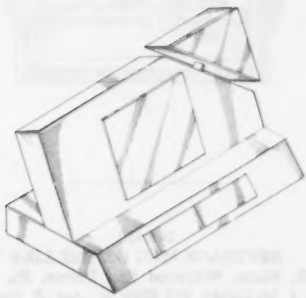
249,433
MODULAR NEWSSTAND
Roger Leonard Carlsen, Yonkers, N.Y., assignor to Jacob Frohlich Cabinet Works Inc.
Filed Aug. 2, 1977, Ser. No. 821,327
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—184



249,434
PHONOGRAPH RECORD SUPPORT STAND OR SIMILAR ARTICLE
David Peter Harris, London, England, assignor to Pye Limited, Cambridge, England
Filed Nov. 29, 1976, Ser. No. 745,959
Claims priority, application United Kingdom, Jun. 2, 1976, 975955/76
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185



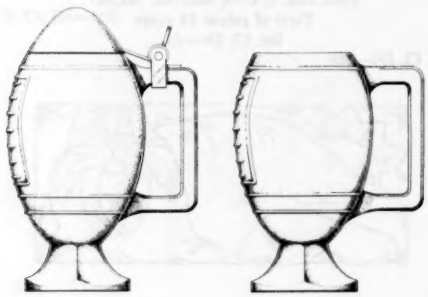
249,435
PICTURE HOLDER
Richard K. Ishmael, 31 Alta Vista Way, San Rafael, Calif. 94901
Filed Jul. 21, 1976, Ser. No. 707,332
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—233



249,436
SLEEPING BAG
Margaret J. Myers, 282 Viejo, Laguna Beach, Calif. 92651
Filed Feb. 7, 1977, Ser. No. 765,947
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—268

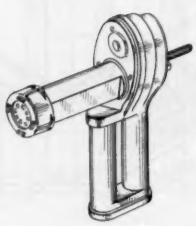
249,437
SLEEPING BAG
Margaret J. Myers, 282 Viejo, Laguna Beach, Calif. 92651
Filed Feb. 4, 1977, Ser. No. 767,466
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—268

249,438
BEVERAGE MUG OR THE LIKE
Kenneth R. Meier, Wildwood Rd., Beaver, Pa. 15009, and Thomas J. McKnight, 513 Fifth St., Apt. B, New Brighton, Pa. 15066
Filed Dec. 20, 1976, Ser. No. 752,130
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5

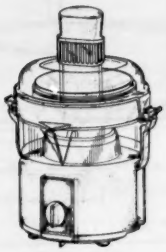


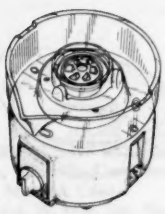
249,439
BOWL OR SIMILAR ARTICLE
Frank J. Benes, and James Lloyd Thrush, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 487,456, Jul. 11, 1974, Pat. No. D. 243,463.
This application Feb. 6, 1976, Ser. No. 656,012
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17

249,440
BATTERY OPERATED PRESS FOR COOKIES OR THE LIKE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Jul. 14, 1976, Ser. No. 705,124
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

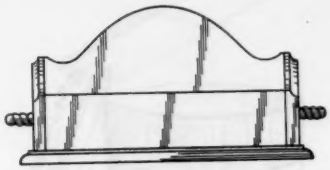


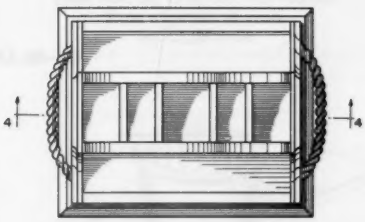
249,441
JUICER
Noboru Fukumoto, Toyonaka, and Shyusuke Inoue, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan
Filed Aug. 2, 1976, Ser. No. 711,082
Claims priority, application Japan, Feb. 4, 1976, 51-3427
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—49



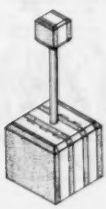


249,442
CADDY FOR TABLEWARE UTENSILS OR SIMILAR ARTICLES
Paul E. Helgesen, Seven Valleys, and William S. Ripley, III, York, both of Pa., assignors to Susquehanna Broadcasting Co., York, Pa.
Filed Oct. 6, 1976, Ser. No. 730,247
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—73





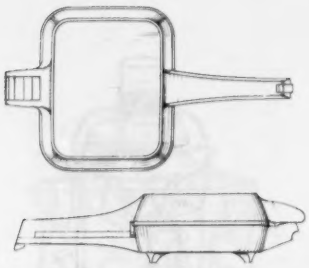
249,443
KNIFE HOLDER
Anton Ackerman, Billerica, and William J. Jones, Saugus, both of Mass., assignors to Dynamic Designs, Inc., Saugus, Mass.
Filed Jul. 1, 1976, Ser. No. 701,650
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74



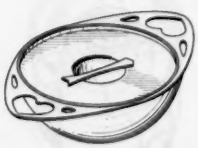
249,444
ICE BUCKET
Earl G. Forsberg, 761 Morosgo Dr., NE., Apt. 6, Atlanta, Ga. 30324
Continuation-in-part of Ser. No. 719,210, Aug. 31, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 852,180
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—78

249,445
STORAGE JAR OR SIMILAR ARTICLE
Frank J. Benes, and James Lloyd Thrush, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 487,456, Jul. 11, 1974, Pat. No. D. 243,463. This application Jan. 5, 1976, Ser. No. 646,507
Term of patent 14 years
Int. Cl. D7—*07, 01*
U.S. Cl. D7—79

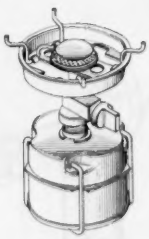
249,446
SANDWICH MAKER
Alfred W. Madl, Glendale, and Charles J. Kirschling, Milwaukee, both of Wis., assignors to Oster Corporation, Milwaukee, Wis.
Filed Jul. 14, 1976, Ser. No. 705,083
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



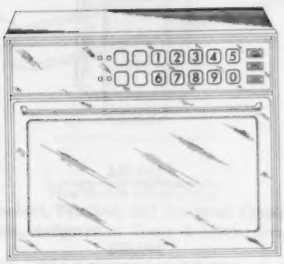
249,447
COMBINED COOKING AND SERVING BOWL
Coley T. Brown, Box 133-G, Browns Corners Rd., Jamesburg, N.J. 08831
Filed Sep. 21, 1976, Ser. No. 723,791
Term of patent 14 years
Int. Cl. D7—*02, 01*
U.S. Cl. D7—97



249,448
PORTABLE CARTRIDGE GAS COOKING STOVE
Marcel Vache, Sainte-Foy-les-Lyon, France, assignor to Application Des Gaz, Paris, France
Filed Mar. 11, 1977, Ser. No. 776,685
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110

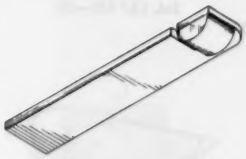


249,449
MICROWAVE OVEN
John J. Pink, 519 33rd St., NE., Cedar Rapids, Iowa 52402, and Jerry L. Walter, 6126 Underwood Ave., SW., Cedar Rapids, Iowa 52404
Continuation of Ser. No. 626,093, Oct. 28, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,938
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

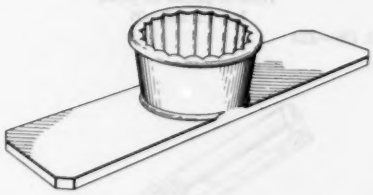


249,450
ARTICLE OF FLATWARE
Ronald A. Guodace, Yalesville, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Jul. 29, 1976, Ser. No. 709,593
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

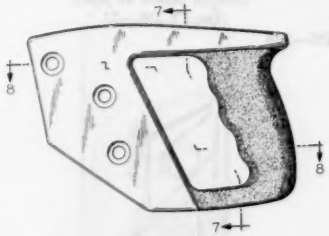
249,451
OPENING TOOL FOR TEAR-OPEN-TYPE CONTAINERS
Albert Frank Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jul. 29, 1976, Ser. No. 709,758
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—18



249,452
COMBINED BOTTLE CAP TIGHTENER AND REMOVER
Simon Gendron, Montreal, Canada, assignor to Payge Manufacturing (1973) Limited, Montreal, Canada
Filed Nov. 30, 1976, Ser. No. 746,010
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—40



249,453
HANDLE FOR HAND SAW
Laird F. Covey, Easton, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Aug. 9, 1976, Ser. No. 712,461
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—97



249,454

HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE

Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed May 12, 1976, Ser. No. 685,570
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 6 AR 235/75
Term of patent 14 years
Int. Cl.[2] D8—*06*
U.S. Cl. D8—313

249,455

HINGE

Alan G. Tilley, 10 Mountain View Rd., New Germany, Natal, South Africa

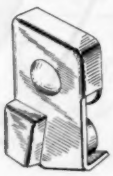
Filed Jan. 31, 1977, Ser. No. 764,465
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323

249,456

LATCH

Carmen Testa, Stamford, Conn., assignor to Excelsior Hardware Company, Stamford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,970
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—338

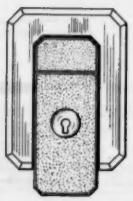


249,457

DRAW BOLT FOR LUGGAGE OR THE LIKE

Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

Filed Mar. 14, 1977, Ser. No. 777,085
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—338

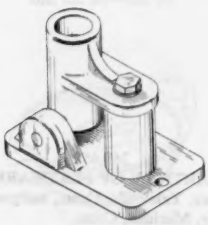


249,458

MOORING WHIP BASE

Robert H. Olsen, 106 SE. 10th St., Ft. Lauderdale, Fla. 33316

Filed Jul. 6, 1976, Ser. No. 702,467
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D8—349

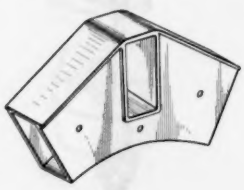


249,459

ANGLE JOINT FOR BUILDING SYSTEM

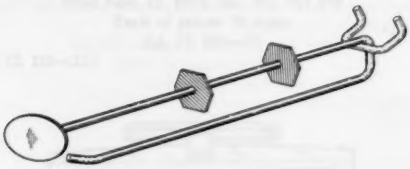
Keith Halliwell, Collaroy, Australia, assignor to Injectaform Pty. Limited, Brookvale, Australia

Filed Feb. 9, 1976, Ser. No. 656,823
Claims priority, application Australia, Aug. 11, 1975, 6755/75
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



249,460
HANGER BRACKET
Theodore Magnus Bleed, Rockford, Ill., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Aug. 12, 1976, Ser. No. 713,878
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

249,461
HANGER BRACKET
Frank E. Swinehart, Fairfield, and Lawrence Castel, Stamford, both of Conn., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Aug. 16, 1976, Ser. No. 714,500
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

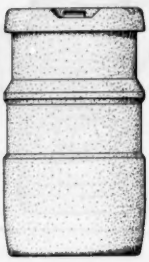


249,462
BOTTLE
Allen Schwartz, Mill Valley, and Wayne A. Bonnett, Sausalito, both of Calif., assignors to Sonoma Vineyards, Windsor, Calif.
Filed Dec. 27, 1976, Ser. No. 754,283
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—1

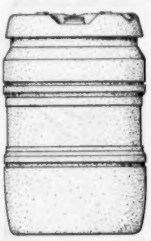
249,463
JAR
Floyd E. Pettengill, Lancaster, Ohio, assignor to General Foods Corporation, White Plains, N.Y.
Division of Ser. No. 567,462, Apr. 14, 1975, Pat. No. Des. 242,222. This application Aug. 24, 1976, Ser. No. 717,070
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—58

249,464
BOTTLE
Luigi A. G. Smali, 1201 Steeles Ave. West, Suite 1203, Willowdale, Ontario, Canada
Filed Jul. 2, 1976, Ser. No. 702,223
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

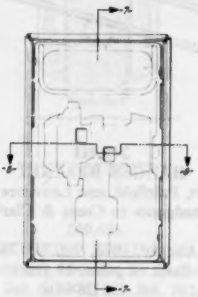
249,465
PLASTIC DRUM
James A. MacTavish, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Nov. 2, 1976, Ser. No. 738,337
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—170



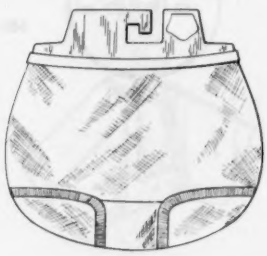
249,466
PLASTIC DRUM
David C. Parrish, Sr., Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Nov. 2, 1976, Ser. No. 738,338
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—170



249,467
BOX FOR A LOCK SET
Richard E. Jones, Pleasanton, and Joseph R. Quiroz, South San Francisco, both of Calif., assignors to Schlage Lock Company, San Francisco, Calif.
Filed Oct. 20, 1976, Ser. No. 734,266
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185

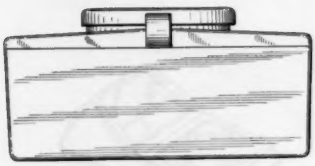


249,468
PANTYHOSE PACKAGE
Barry G. Carroll, Burlington, N.C., assignor to Burlington Industries, Inc.
Filed Jul. 2, 1976, Ser. No. 702,359
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191

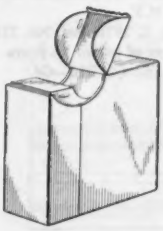


249,469
CANDY DISPENSER
Frank Russert, Palos Heights, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,396
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

249,470
DISPENSING CONTAINER
Saul Robert Kohn, Dresher, Pa., assignor to Youngs Drug Products Corporation, Piscataway, N.J.
Filed Nov. 12, 1976, Ser. No. 741,199
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—232



249,471
CANDY DISPENSER
Walter Stern, Wilmette, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,466
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235



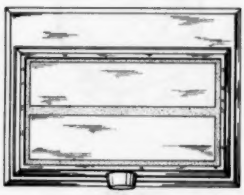
249,472
PEANUT WATCH
Betty L. Sumpter, 6413 Jackson St., Pittsburgh, Pa. 15206
Filed Sep. 17, 1976, Ser. No. 724,343
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—36

249,473
SUNDIAL
Daniel L. Wenger, P.O. Box 221, Soquel, Calif. 95073
Filed Jan. 12, 1977, Ser. No. 758,669
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—45

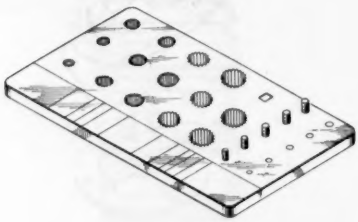
249,474
COMBINATION SUNDIAL AND NOCTURNAL CELESTIAL TIMEPIECE
James E. Wagoner, Swanton, Ohio, assignor to Toledo Astronomical Association, Toledo, Ohio
Filed Feb. 22, 1977, Ser. No. 770,521
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—45

249,475
ELECTRONIC THERMOMETER HOUSING
Robert Bruce Turner, Weymouth, and Paul E. Brefka, Southboro, both of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Apr. 28, 1976, Ser. No. 681,209
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

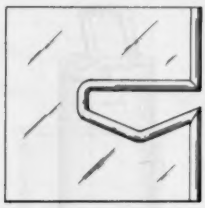
249,476
THERMOSTAT COVER
Donald P. Kolbow, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 29, 1976, Ser. No. 681,651
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60



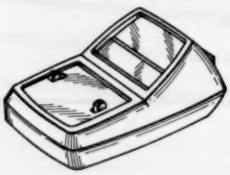
249,477
FAUCET STEM SIZE GUIDE
Var E. Lordahl, Chicago, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Oct. 12, 1976, Ser. No. 731,853
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



249,478
DRAWING GUIDE FOR MUSIC
Richard A. Hopper, 5723 34th Ave., Moline, Ill. 61265
Filed Jul. 19, 1976, Ser. No. 706,821
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



249,479
TIMING METER
Howard J. Rasmussen, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Jul. 17, 1975, Ser. No. 596,665
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



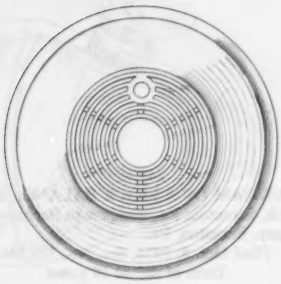
249,480
PH TESTING DEVICE
Maury Jungman, Bayville, N.Y., assignor to J & M Instruments Corp., Farmingdale, N.Y.
Filed Aug. 2, 1976, Ser. No. 711,096
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81

249,481

HOUSING FOR FIRE AND SMOKE DETECTOR

Frederick J. Conforti, Aurora; Roy C. A. Robertson, Bolingbrook, and Harvey Hanig, North Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Jul. 5, 1977, Ser. No. 812,512
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

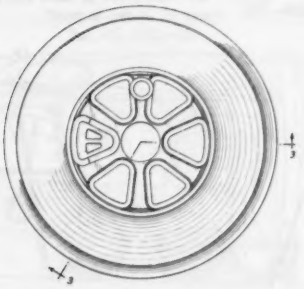


249,482

HOUSING FOR FIRE AND SMOKE DETECTOR

Frederick J. Conforti, Aurora; Roy C. A. Robertson, Bolingbrook, and Harvey Hanig, North Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Jul. 5, 1977, Ser. No. 813,130
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

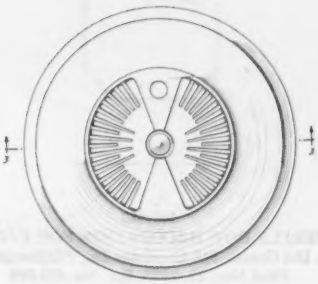


249,483

HOUSING FOR FIRE AND SMOKE DETECTOR

Frederick J. Conforti, Aurora; Roy C. A. Robertson, Bolingbrook, and Harvey Hanig, North Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Jul. 5, 1977, Ser. No. 813,219
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



249,484

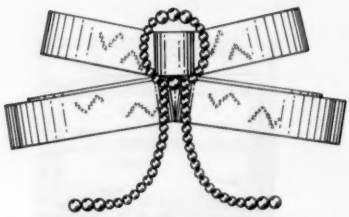
ENGINE TIMING LIGHT

DeWayne J. Shumway, Fruita, and William F. Burke, Grand Junction, both of Colo., assignors to Dixson, Inc., Grand Junction, Colo.

Filed Jan. 6, 1977, Ser. No. 757,396
Term of patent 14 years
Int. Cl.[2] D10—*05*
U.S. Cl. D10—112

249,485
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,757
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—125

249,486
BUTTERFLY BOW DECORATION FOR PACKAGES
Elaine V. Del Grosso, 318 Greenway Dr., Pittsburgh, Pa. 15235
Filed Nov. 12, 1975, Ser. No. 631,099
Term of patent 14 years
Int. Cl. D5—*04;* D11—*05*
U.S. Cl. D11—137

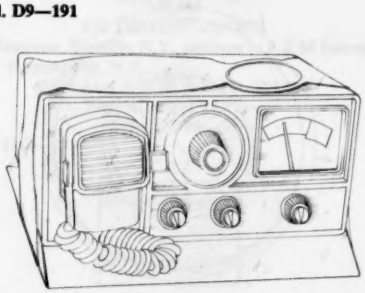


249,487
PLAQUE WITH SUNK RELIEF
Jerome A. Grunstad, West Saint Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 18, 1977, Ser. No. 788,659
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

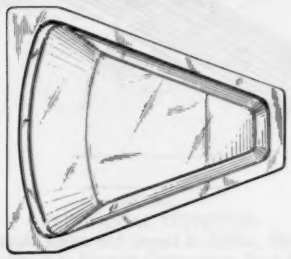
249,488
BENCH SHOOTER FIGURINE
Owen R. Siegel, 1517 Basswood Dr., Glenview, Ill. 60025
Filed May 11, 1976, Ser. No. 685,276
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

249,489
CROSSBEAM OF A MOCK BALANCE SCALE
Peter Horvick, Scranton, Pa., assignor to Bardane Manufacturing Company, Scranton, Pa.
Filed Oct. 5, 1976, Ser. No. 729,794
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

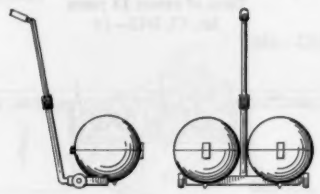
249,490
TOY TRANSCEIVER PACKAGE
Beverly W. Taylor, Hermann, and Reet Thomas, Jr., St. Louis, both of Mo., assignors to Steven Manufacturing Company, Hermann, Mo.
Filed Oct. 18, 1976, Ser. No. 733,455
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191



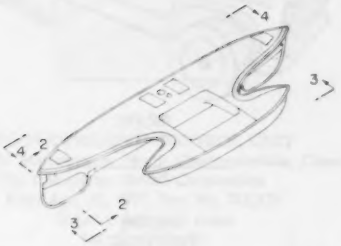
249,491
PIE PORTION CONTAINER
Daniel Bernhardt, P.O. Box 681, Rutland, Vt. 05701
Filed Jul. 21, 1976, Ser. No. 707,244
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



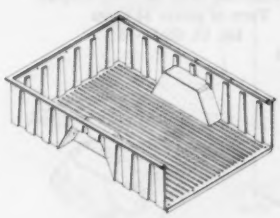
249,492
DUAL BOWLING BALL CADDY
Blanche A. Morley, 3401 N. Franklin, Stockton, Calif. 95204
Filed Mar. 2, 1977, Ser. No. 777,945
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—33



249,493
HULL FOR A SAILBOAT
Richard Lynn Rineman, 4644 Mount Brighton Ave., Brighton, Mich. 48116, assignor to Harold J. Rineman; Richard Lynn Rineman; S. Albert Young and Benjamin W. Colman, part interest to each
Continuation-in-part of Ser. No. 629,689, Nov. 6, 1975, Pat. No. D. 242,614. This application Sep. 7, 1976, Ser. No. 721,132
The portion of the term of this patent subsequent to Dec. 7, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

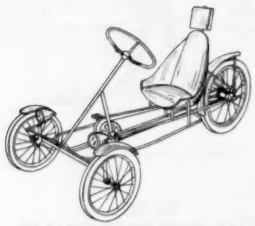


249,494
CARGO BOX LINER FOR PICKUP TRUCKS
Robert H. Lambitz, Linden, and Robert J. Zeffero, Fenton, Mich., assignors to Zefflamb Industries, Inc.
Filed Dec. 17, 1976, Ser. No. 751,372
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—98

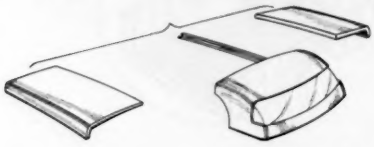


249,495
VAN
Earl C. Wallace, and Richard A. Bell, both of Andrews, Ind., assignors to General Engineering & Manufacturing Corporation, Andrews, Ind.
Filed Dec. 20, 1976, Ser. No. 752,249
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99

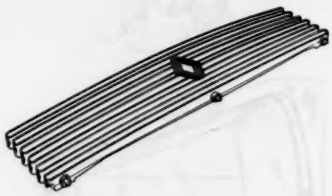
249,496
TRICYCLE
George W. Morgan, 405 Riverdale Dr., Rocky River, Ohio 44116
Filed Aug. 12, 1977, Ser. No. 824,250
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



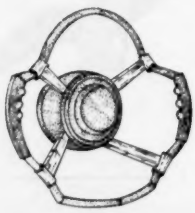
249,497
THREE PIECE CONVERTIBLE HARDTOP
John Slider, Box 43, Merrittstown, Pa. 15463
Filed Mar. 24, 1976, Ser. No. 669,913
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



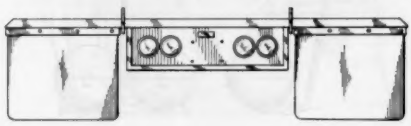
249,498
CAR RADIATOR GRILLE
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Jul. 21, 1975, Ser. No. 597,719
Claims priority, application France, Feb. 20, 1975, 73 636
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—163



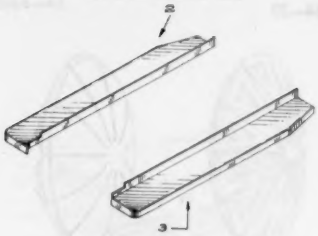
249,499
STEERING WHEEL
John T. LeRose, 31-74 37th St., Astoria, N.Y. 11102
Filed Oct. 26, 1976, Ser. No. 735,816
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—175



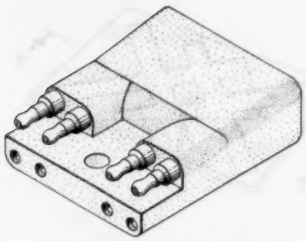
249,500
COMBINED MUDGUARD AND LIGHT SUPPORT FOR TRUCKS
Ronald A. Cox, 1018 Q. St., Apt. 3, Springfield, Oreg. 97477
Filed Jan. 18, 1977, Ser. No. 760,438
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



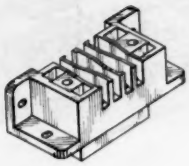
249,501
SET OF VEHICLE RUNNING BOARDS
Leon Chapman, 414 Oak St., Ypsilanti, Mich. 48197
Filed Mar. 7, 1977, Ser. No. 774,671
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



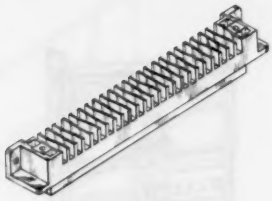
249,502
ELECTRICAL TERMINAL
Richard J. Rink, Evart, and Gerald K. Miller, Hersey, both of Mich., assignors to Nartron Corporation, Reed City, Mich.
Filed Mar. 16, 1977, Ser. No. 778,121
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



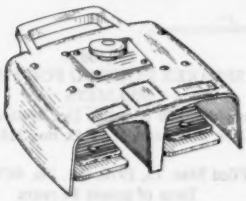
249,503
ELECTRICAL CONNECTOR
Arthur Thomas Spencer, Biggleswade, and Paul Robert Hardy, Upper Caldecote, both of England, assignors to Pye (Electronic Products) Limited, Cambridge, England
Filed Apr. 18, 1977, Ser. No. 788,122
Claims priority, application United Kingdom, Oct. 19, 1976, 977566/76
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



249,504
ELECTRICAL CONNECTOR
Arthur Thomas Spencer, Biggleswade, and Paul Robert Hardy, Upper Caldecote, both of England, assignors to Pye (Electronic Products) Limited, Cambridge, England
Filed Apr. 18, 1977, Ser. No. 788,121
Claims priority, application United Kingdom, Oct. 19, 1976, 977567/76
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

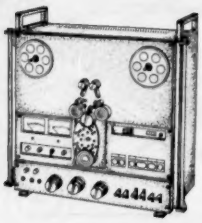


249,505
FOOT OPERATED CONTROL UNIT
Alfred R. Di Bonaventura, North Grosvernordale, Conn., assignor to The Linemaster Switch Corporation
Filed Apr. 11, 1977, Ser. No. 786,121
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—36

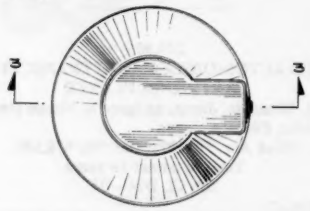


249,506
COMBINED AUTOMOBILE RADIO TRANSCEIVER AND CARTRIDGE PLAYER
Kazuo Arai, Kitamoto, Japan, assignor to Nissan Denshi Kabushiki Gaisha, Ohmiya, Japan
Filed Apr. 20, 1976, Ser. No. 678,904
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—7

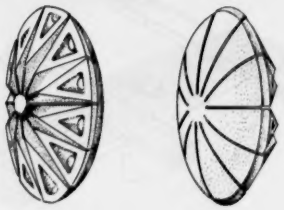
249,507
TAPE RECORDER
Takemi Ebata, Kyoto, and Kunishige Miki, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Kadoma, Japan
Filed Dec. 23, 1976, Ser. No. 753,913
Claims priority, application Japan, Jul. 9, 1976, 51-26599
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—8



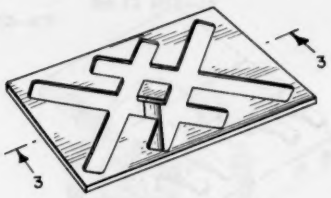
249,508
AUDIO SPEAKER HOUSING FOR PROTECTIVE HELMETS
Ronald D. Coughlin, 100 W. Alma Dr., Melbourne, Fla. 32935, and Kenneth E. Pohlmann, Jr., P.O. Box 219, Melbourne, Fla. 32901
Filed Mar. 15, 1976, Ser. No. 667,184
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—37



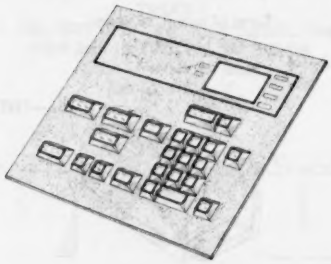
249,509
ACOUSTICAL TRANSFORMER FOR COUPLING SOUND WAVES FROM THE DIAPHRAGM TO THE THROAT OF A HORN-TYPE LOUDSPEAKER
Clifford A. Henricksen, Yorba Linda, Calif., assignor to Altec Corporation, Anaheim, Calif.
Filed Sep. 23, 1976, Ser. No. 725,981
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—37



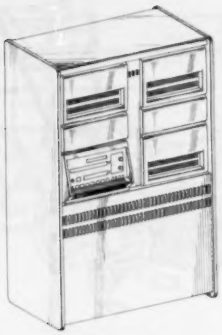
249,510
POS OPTICAL SCANNING STATION
Paul S. Wu, Randolph, and Dominick S. Fazio, Whippany, both of N.J., assignors to Litton Business Systems, Inc.
Filed May 2, 1975, Ser. No. 574,138
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



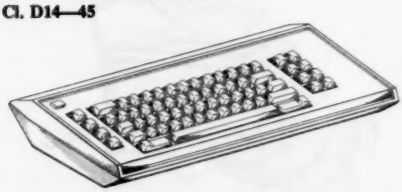
249,511
KEYBOARD FOR ELECTRONIC APPARATUS
Richard Joseph Olson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 31, 1977, Ser. No. 802,107
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



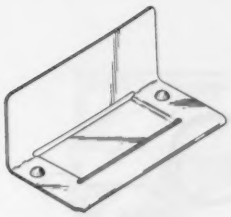
249,512
COMPUTER SYSTEM
Richard C. Schneider, Marlboro; Paul E. Benigni, Bridgewater, both of Mass., and Allan E. Weaver, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed May 2, 1977, Ser. No. 793,091
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



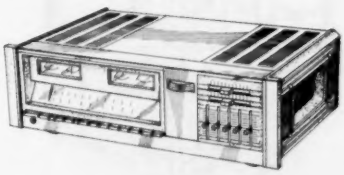
249,513
KEYBOARD
Clarence D. Zierhut, Richardson, Tex., assignor to Mohawk Data Sciences Corp., Herkimer, N.Y.
Filed Nov. 15, 1976, Ser. No. 742,031
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45



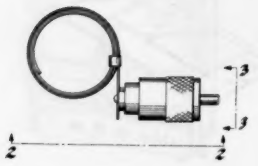
249,514
NOTEPAD ATTACHMENT FOR A TELEPHONE
Kurt M. Loeb, Melrose Park, Pa., assignor to Ed Letven, Jenkintown, Pa., a part interest
Filed Jul. 29, 1976, Ser. No. 709,672
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—59



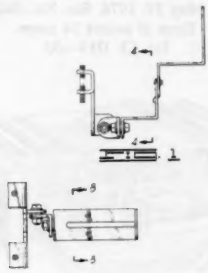
249,515
COMBINED RADIO RECEIVER, TUNER AND AMPLIFIER
Ken Kira; Kinshiro Nakazawa, both of Yokohama, and Katsuji Yoshida, Kamakura, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed May 27, 1976, Ser. No. 690,774
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



249,516
EMERGENCY ANTENNA
Jay S. Reisman, 4808 D La Villa Marina, Marina del Rey, Calif. 90291
Filed Feb. 7, 1977, Ser. No. 766,031
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86

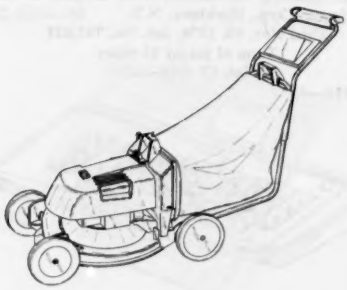


249,517
ANTENNA MOUNTING SUPPORT
Alfred P. Parduhn, 14501 Wilson Rd., Edmond, Okla. 73034
Continuation-in-part of Ser. No. 246,585, Jun. 1, 1976. This application Jul. 8, 1977, Ser. No. 814,031
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D14—91

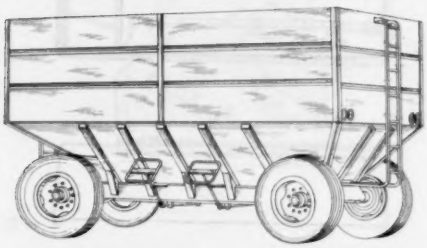


249,518
ROTO-TILLER
Larry M. Cognata, and Thomas C. Appleton, both of Nashville, Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Aug. 12, 1976, Ser. No. 713,992
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

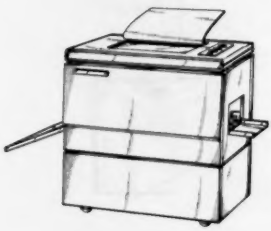
249,519
COMBINED LAWN MOWER AND GRASS CATCHER
Donald Gene Haffner, Glendale, and Neill Carl Woelffer, Racine, both of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.
Filed Jul. 25, 1977, Ser. No. 818,983
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—14



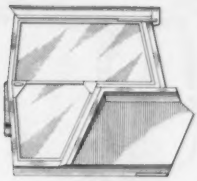
249,520
GRAIN WAGON
Michael D. Van Mill, R.R. #1, Shell Rock, Iowa 50670
Filed Dec. 14, 1976, Ser. No. 750,501
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



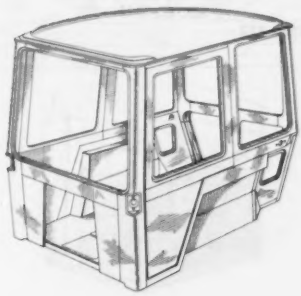
249,521
ELECTRONIC COPIER
Kanzi Murai, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Jan. 18, 1977, Ser. No. 760,415
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



249,522
TRACTOR CAB
Lee E. Elfes, Bloomfield Hills, and Leo J. Lorenz, Farmington, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.
Continuation-in-part of Ser. No. 659,067, Feb. 18, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,377
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—30

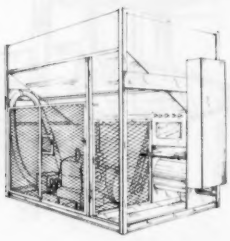


249,523
ENCLOSURE FOR A TRACTOR TYPE VEHICLE
Jaime Segales, Vallirana (Barcelona), Spain, assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed Mar. 17, 1977, Ser. No. 778,805
Term of patent 7 years
Int. Cl. D12—*09*
U.S. Cl. D15—30

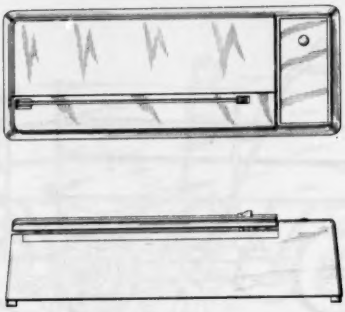


249,524
SUCTION CLEANER UPPER HOUSING AND BAG OR THE LIKE
Richard A. Wareham, 2315 Schneider Rd., NE., North Canton, Ohio 44721
Filed Nov. 8, 1976, Ser. No. 739,631
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—62

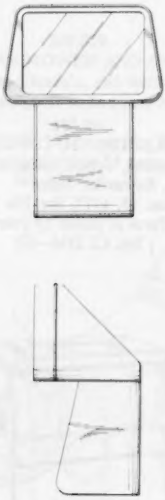
249,525
INSULATION APPLICATION UNIT
Henry Sperber, Englewood, Colo., assignor to Ark Seal Corporation
Filed Oct. 26, 1976, Ser. No. 735,174
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—122



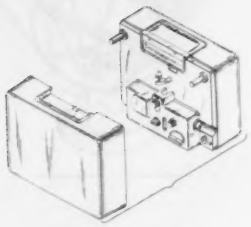
249,526
PLASTIC BAG FORMING AND SEALING APPARATUS
Shizuaki Kishida, Atsugi, Japan, assignor to Sanyei Corporation, Tokyo, Japan
Filed Oct. 28, 1976, Ser. No. 736,575
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—146



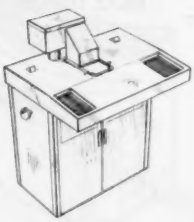
249,527
AUDIO VISUAL DISPLAY CABINET
Joseph F. Stralka, South Euclid, Ohio, assignor to Rappaport Exhibits, Inc., Cleveland, Ohio
Filed Aug. 25, 1976, Ser. No. 717,475
Term of patent 14 years
Int. Cl. D16—*02;* D14—*02*
U.S. Cl. D16—14



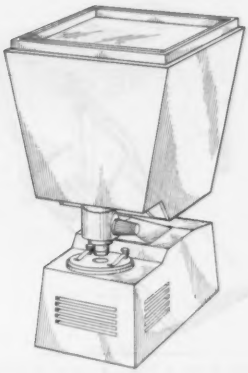
249,528
MOTION PICTURE PROJECTOR
Paul D. Miller, New York, N.Y., and John Svezia, Milburn, N.J., assignors to GAF Corporation, New York, N.Y.
Filed Jan. 21, 1977, Ser. No. 761,387
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—23



249,529
PHOTOGRAPHIC PRINTER
Patrick J. Gilligan, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.
Filed Mar. 11, 1977, Ser. No. 776,877
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—34



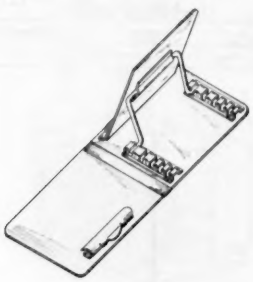
249,530
HAIR MICROANALYZER
Colin Brett, West Paterson, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Oct. 22, 1976, Ser. No. 734,920
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48



249,531
JACKET FOR A COMBINED PHOTO CALCULATOR AND DIGITAL RULER
Kurt Neufeld, 22665 Napoli, Laguna Hills, Calif. 92653
Filed Apr. 5, 1976, Ser. No. 673,616
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—3

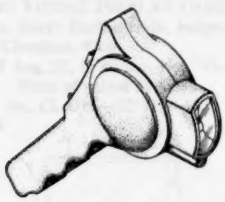
249,532
FOLDABLE PORTFOLIO WITH AN ADJUSTABLE EASEL
Murphy Dennis Cudahy, III, 2037 Beverly Pl., South Bend, Ind. 46616, and Joseph Lloyd Mossey, 59483 Clover Rd., Mishawaka, Ind. 46544
Continuation-in-part of Ser. No. 475,391, Jun. 3, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,543
Term of patent 7 years
Int. Cl. D19—*06*
U.S. Cl. D19—35

249,533
FOLDABLE PORTFOLIO WITH AN ADJUSTABLE EASEL
Murphy Dennis Cudahy, III, 2037 Beverly Pl., South Bend, Ind. 46616, and Joseph Lloyd Mossey, 59483 Clover Rd., Mishawaka, Ind. 46544
Continuation-in-part of Ser. No. 475,503, Jun. 3, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,544
Term of patent 7 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



249,534
GLOBE
Don W. Denney, 19215 Marine View Cir. SW., Seattle, Wash. 98166
Filed Feb. 14, 1977, Ser. No. 768,216
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—61

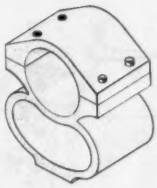
249,535
NON-LETHAL PERSONAL DEFENSE WEAPON
Burton M. Cantor, 2519 E. Palmera Dr., Las Vegas, Nev. 89121
Filed Feb. 24, 1977, Ser. No. 771,787
Term of patent 14 years
Int. Cl. D22—*02*; D26—*02*
U.S. Cl. D22—1



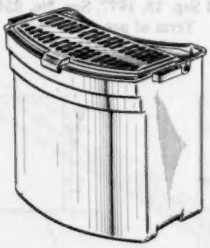
249,536
FISHING LURE BODY
Robert Glynn Carver, P.O. Box 996, Minden, La. 71055
Filed Mar. 31, 1977, Ser. No. 783,466
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

249,537
FISHING LURE
Douglas W. Parker, 1801 Garner La., Fort Smith, Ark. 72901
Continuation of Ser. No. 585,704, Jun. 10, 1975, abandoned.
This application Sep. 20, 1976, Ser. No. 724,512
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

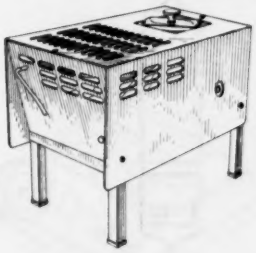
249,538
TELESCOPIC SIGHT MOUNT FOR FIREARMS
Gerald T. Weast, 23702 Crossley, Hazel Park, Mich. 48050
Filed Dec. 16, 1976, Ser. No. 751,136
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



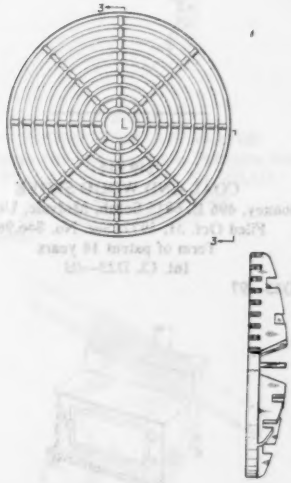
249,539
LIVE-BAIT CONTAINER
Andrew O. Lightfoot, 2848 Bonnywood, Dallas, Tex. 75233
Filed Jul. 9, 1976, Ser. No. 704,043
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—14



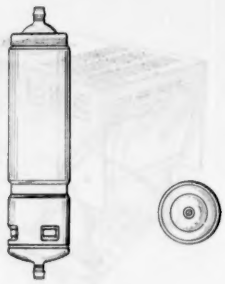
249,540
WATER STILL
Paul S. Giovagnoli, 4200 NE. Birmingham Rd., Kansas City, Mo. 64116
Filed Nov. 15, 1976, Ser. No. 741,774
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



249,541
FILTER BAFFLE PLATE
Peter A. Cattano, Sr., 140 E. Merrick Rd., Freeport, N.Y. 11520
Filed Feb. 2, 1977, Ser. No. 767,284
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

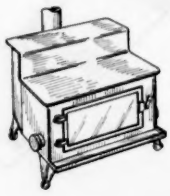


249,542
WATER FILTER
Albert Horace Aldridge, Maple Cross Nr. Rickmansworth, and Michael Pizzey, Reading, both of England, assignors to Thomas Ness Limited, Harrow-on-the-Hill, England
Filed Jan. 17, 1977, Ser. No. 760,023
Claims priority, application United Kingdom, Sep. 24, 1976, 977303/76
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

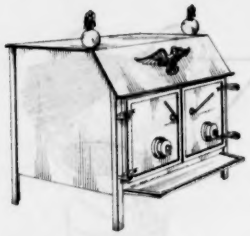


249,543
EXTENSION FOR A FIRE PLACE DAMPER LEVER
Turner C. Smith, 6280 E. Powers Ave., Englewood, Colo. 80110
Filed May 10, 1976, Ser. No. 684,908
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

249,544
COAL AND WOOD STOVE
Fred J. Bonney, 496 E. 6815 South, Midvale, Utah 84047
Filed Oct. 31, 1977, Ser. No. 846,964
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

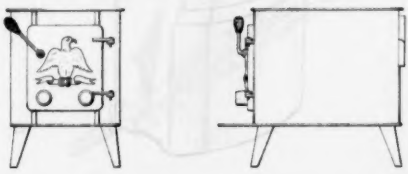


249,545
WOOD BURNING STOVE
Edmund P. Bullard, Sr., R.D. 2, Lyons, N.Y. 14489, and Gary A. Togni, 402 Palmer Dr., N. Syracuse, N.Y. 13212
Filed Mar. 31, 1977, Ser. No. 783,165
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

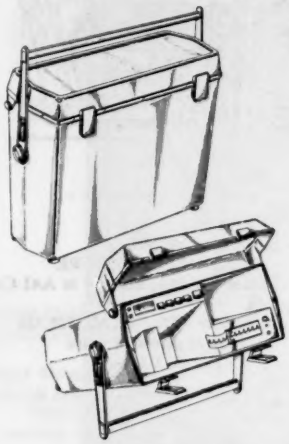


249,546
WOOD BURNING STOVE
Edmund P. Bullard, Sr., R.D. 2, Lyons, N.Y. 14489, and Gary A. Togni, 402 Palmer Dr., N. Syracuse, N.Y. 13212
Filed Mar. 31, 1977, Ser. No. 783,163
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

249,547
WOOD BURNING STOVE
Arthur B. Pruitt, Rocky Mount, Va., assignor to Pruitt's Welding & Wood Burning Stove Shop, Inc., Rocky Mount, Va.
Filed Sep. 19, 1977, Ser. No. 834,699
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

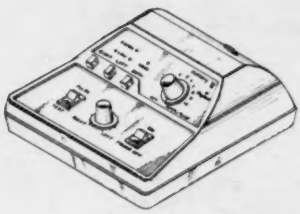


249,548
CARDIORESUSCITATION SYSTEM PACKAGE
Joseph D. Napoli, Billerica, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 4, 1976, Ser. No. 729,615
Term of patent 14 years
Int. Cl. D24—*02, 01*
U.S. Cl. D24—17



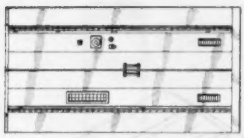
249,549
ELECTROSURGICAL HANDLE
Harold L. Pike, Littleton, Colo., assignor to Aspen Laboratories, Inc., Littleton, Colo.
Filed Oct. 22, 1976, Ser. No. 735,119
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—30

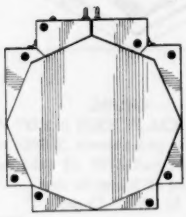
249,550
MUSCLE STIMULATING PULSE GENERATOR
Bernard Jankelson, 1451 Medical-Dental Bldg., Seattle, Wash. 98101, and John C. Radke, Seattle, Wash., assignors to Bernard Jankelson, Seattle, Wash.
Filed Jun. 27, 1977, Ser. No. 810,586
Term of patent 14 years
Int. Cl. D28—*03;* D24—*01*
U.S. Cl. D24—36



249,551
THERAPEUTIC APPARATUS
Monte H. Greenawalt, 225 Southgate, Dubuque, Iowa 52001
Filed Jul. 15, 1976, Ser. No. 705,615
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36

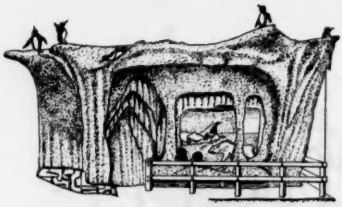
249,552
WALK-IN CABINET FOR RADIATION TREATMENT OF DISEASE
Jack H. Schwartz, Shaker Heights, Ohio, assignor to National Biological Corporation, Cleveland, Ohio
Filed Mar. 1, 1976, Ser. No. 662,613
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—39



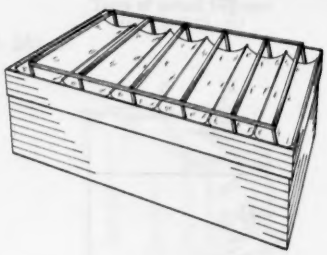


249,553
PIPETTE
Ronald Leo Sturm, San Carlos, and James Curtis Smith, Hayward, both of Calif., assignors to Oxford Laboratories, Inc., Foster City, Calif.
Filed Aug. 25, 1976, Ser. No. 716,751
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—55

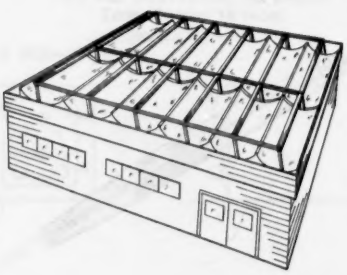
249,554
AMUSEMENT PARK BUILDING
Robert F. Ott, Allentown, Pa., assignor to Dorney Park Coaster Company, Inc., Allentown, Pa.
Filed Nov. 26, 1976, Ser. No. 745,340
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—9



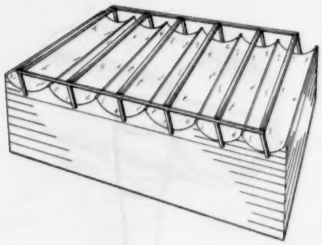
249,555
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,326
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



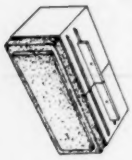
249,556
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,327
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



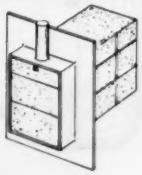
249,557
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,324
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



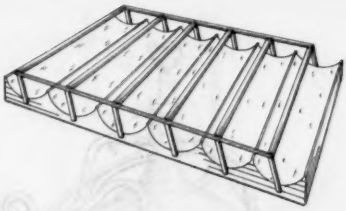
249,558
COMBINED ELASTIC FRAME AND MOLD BLOCK FOR FIREPROOF FEED-THROUGH OF ELECTRIC CABLES OR THE LIKE
Erik Mikael Blomqvist, Karlskrona, Sweden, assignor to AB Lyckeaborgs Bruk, Karlskrona, Sweden
Filed Dec. 21, 1976, Ser. No. 757,222
Claims priority, application Sweden, Sep. 24, 1976, 76-1863
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—35



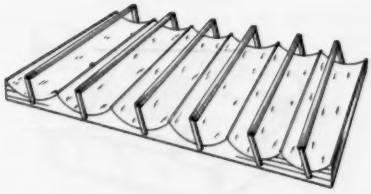
249,559
COMBINED ELASTIC FRAME AND MOLD BLOCK FOR FIREPROOF FEED-THROUGH OF ELECTRIC CABLES OR THE LIKE
Erik Mikael Blomqvist, Karlskrona, Sweden, assignor to AB Lyckeaborgs Bruk, Karlskrona, Sweden
Filed Dec. 21, 1976, Ser. No. 757,223
Claims priority, application Sweden, Sep. 24, 1976, 76-1864
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—35



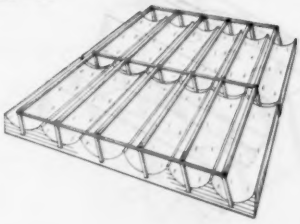
249,560
ROOF STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,299
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—56



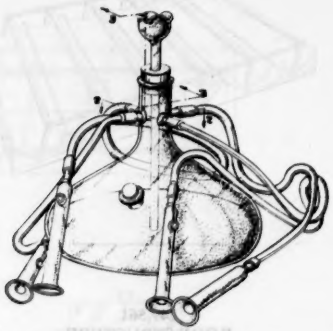
249,561
ROOF STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,300
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—56



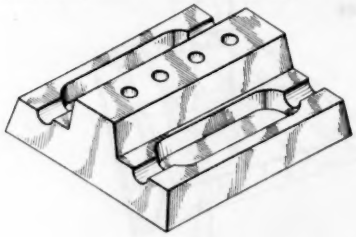
249,562
ROOF STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Dec. 29, 1976, Ser. No. 755,325
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—56



249,563
SMOKING DEVICE
Roger Graham, 5218 Monroe Pl., Hyattsville, Md. 20781
Filed Jan. 16, 1976, Ser. No. 649,814
Term of patent 14 years
Int. Cl. D27—02
U.S. Cl. D27—03

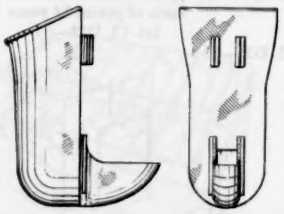


249,564
ASHTRAY
Ernest L. Sackett, 100 Waverly Dr., Grants Pass, Oreg. 97526, and Marvin E. Sackett, 3525 Whitney Ave., #1, Sacramento, Calif. 95821
Filed Oct. 27, 1976, Ser. No. 736,354
Term of patent 14 years
Int. Cl. D27—03
U.S. Cl. D27—29

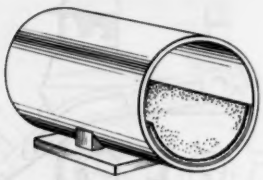


249,565
MANICURING IMPLEMENT
Monte L. Levin, New York, N.Y., assignor to Clairol Incorporated
Filed May 3, 1976, Ser. No. 682,688
Term of patent 14 years
Int. Cl. D28—03
U.S. Cl. D28—58

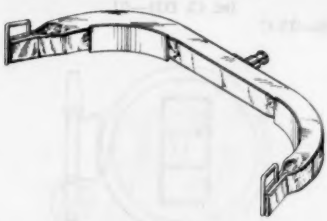
249,566
BIRD FEEDER
William Wilhelm, 209 S. Birch, #C, Santa Ana, Calif. 92701
Filed Sep. 1, 1977, Ser. No. 829,601
Term of patent 14 years
Int. Cl. D30—03
U.S. Cl. D30—15



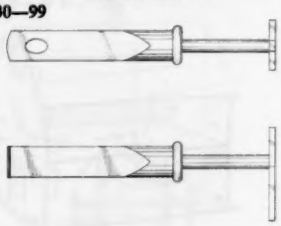
249,567
CAT BED
Loretta Madi, 17 Lenox Ave., Green Brook, N.J. 08812
Filed Sep. 1, 1977, Ser. No. 829,950
Term of patent 14 years
Int. Cl. D30—*06*
U.S. Cl. D30—41



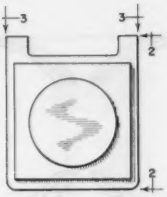
249,568
CALF PULLER BUTT YOKE
Frank Kratky, Rist Canyon Rte., Bellvue, Colo. 80512
Filed Jun. 6, 1977, Ser. No. 804,181
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



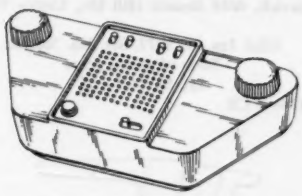
249,569
HORSE FOOT PICK
Carlo J. Moran, 434 Cinnabar, Dallas, Tex. 75227
Filed Aug. 22, 1977, Ser. No. 826,937
Term of patent 14 years
Int. Cl.[2] D30—*99*
U.S. Cl. D30—99



249,570
COMBINED GOLF BALL MARKER AND CARRYING CLIP THEREFOR
Leonard Earl Studt, 470 Sunset Dr., Elgin, Ill. 60120
Filed Jul. 16, 1976, Ser. No. 706,052
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

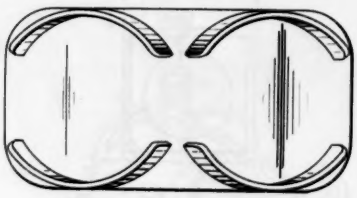


249,571
HOUSING FOR T.V. GAME
Vivian David, Tempe, Ariz., and Ronald Emmerling, New Cit N.Y., assignors to Drawbridge, Inc., Cranford, N.J.
Filed Jul. 30, 1976, Ser. No. 710,338
Term of patent 3 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



249,572
COMBINED HOOP ROLLER AND HOOP
Farrell T. Foster, 2420 Holcomb, Des Moines, Iowa 50310
Filed Sep. 24, 1976, Ser. No. 726,404
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP

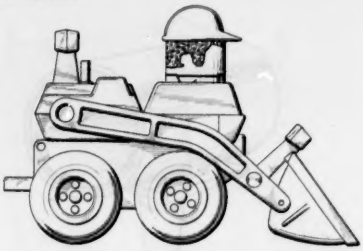
249,573
TENNIS BALL HOLDER
Charles Roy Harris, Jr., 4012 Cherrywood Rd., Austin, Tex. 78722
Filed Nov. 22, 1976, Ser. No. 743,841
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



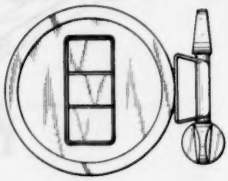
249,574
GOLFER'S TOOL
Boris Kralevich, 4868 Beason Hill Dr., Castro Valley, Calif. 94546
Filed Jan. 28, 1977, Ser. No. 763,342
Term of patent years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

249,575
SKI
Rudolf Ferch, Salzburg, Austria, assignor to Kastle Gesellschaft m.b.H., Innkreis, Austria
Filed May 14, 1976, Ser. No. 686,555
Claims priority, application Austria, Nov. 18, 1975, 18699/75
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—14 D

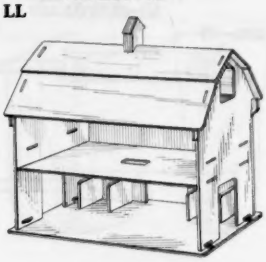
249,576
COMBINED TOY LOADER AND FIGURE THEREFOR
George W. Dunbar, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Oct. 18, 1976, Ser. No. 731,441
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AN



249,577
TOY DRUM
Andrew I. Bergman, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 6, 1976, Ser. No. 748,092
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



249,578
TOY BARN
William Donald Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.
Filed Jan. 31, 1977, Ser. No. 763,881
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

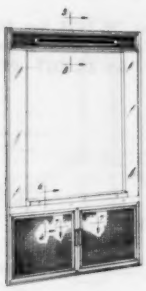


249,579
LANTERN HOLDER
Kenneth J. Kelling, and Barbara A. Kelling, both of 5318 Kingsbridge Rd., Madison, Wis. 53714
Filed Jul. 13, 1977, Ser. No. 815,205
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—4 A

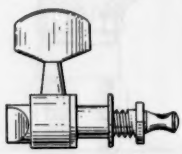
249,580
LAWN DECORATION
Clifford Hill, Rte. 1, Box 184, Grove Hill, Ala. 36451
Filed Sep. 3, 1976, Ser. No. 720,342
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D48—20 E

249,581
PUSH-ON FLASHLIGHT
Werner C. Von Clemm, 214 E. 17th St., New York, N.Y. 10003
Filed Nov. 29, 1976, Ser. No. 745,845
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

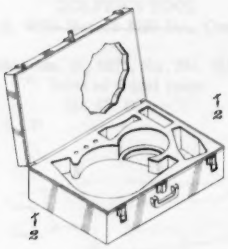
249,582
FRONT DOOR FOR A VENDING MACHINE
Walter E. Moore, Bel-Nor, and Albert K. Grethey, Bridgeton, both of Mo., assignors to UMC Industries, Inc., New York, N.Y.
Filed Jun. 28, 1976, Ser. No. 700,517
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R



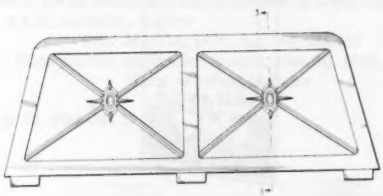
249,583
GUITAR MACHINE
Robert Worthing, and Lawrence Beattie, both of Pompano Beach, Fla., assignors to Mark VI Enterprises, Inc., Pompano Beach, Fla.
Filed Jun. 28, 1976, Ser. No. 700,563
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



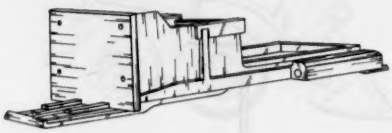
249,584
CARRYING CASE FOR A MUSICAL INSTRUMENT
Robert J. Atkinson, 1427 E. Windsor Rd., Glendale, Calif. 91205
Filed Jul. 12, 1976, Ser. No. 704,162
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B



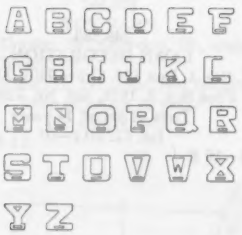
249,585
MUSIC RACK
Harold B. Martin, West Caldwell, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.
Filed Dec. 29, 1975, Ser. No. 644,766
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D56—9



249,586
COMBINED PRINTER AND PAPER-HOLDING SLIDE DEVICE
Joseph Varadi, 8655 SW. 89th, Portland, Oreg. 97225
Filed Jul. 19, 1976, Ser. No. 706,639
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R

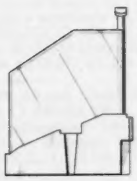


249,587
FONT OF TYPE
Carmino T. Asprinio, East Greenwich, R.I., assignor to Tesoro Manufacturing Co., Inc., Cranston, R.I.
Filed Mar. 14, 1977, Ser. No. 777,421
Term of patent 7 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

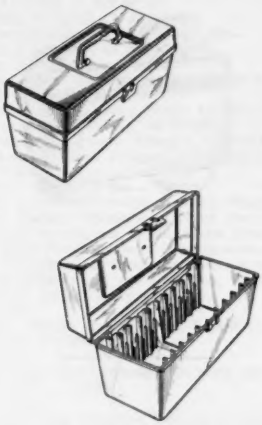


249,588
CANDLE
Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Co., Ltd., Kameyama, Japan
Continuation-in-part of Ser. No. 631,364, Nov. 12, 1975, abandoned, and a continuation-in-part of Ser. No. 631,366, Nov. 12, 1975, abandoned, and a continuation-in-part of Ser. No. 631,390, Nov. 12, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,767
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D73—1 R

249,589
MODULAR CARRIER FOR TUBES OF PAINT OR SIMILAR ARTICLES
Patrick J. Adams, Belle Fontaine, Ohio, assignor to Artex Hobby Products, Inc., Lima, Ohio
Filed Sep. 2, 1976, Ser. No. 719,917
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

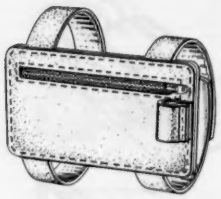


249,590
CARRYING CASE FOR TAPE CARTRIDGES AND CASSETTES
Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed Nov. 26, 1976, Ser. No. 745,233
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



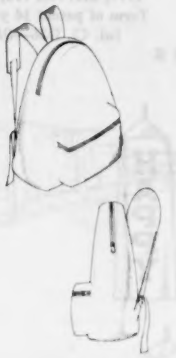
249,591
TOOTHPICK HOLDER
Anthony J. Mijares, Jr., 6001 NW. 153rd St., Miami Lakes, Fla. 33014
Filed Jan. 14, 1977, Ser. No. 759,343
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

249,592
FOREARM CARRYALL
Michael R. Libonati, 2855 Calle La Cota, Thousand Oaks, Calif. 91360
Filed Mar. 9, 1977, Ser. No. 776,003
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 R

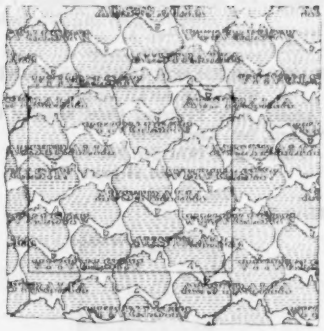


249,593
HANDBAG OR SIMILAR ARTICLE
Ilma R. Glaser, 101 Arundel, St. Louis County, Mo. 63105
Division of Ser. No. 665,966, Mar. 11, 1976. This application Dec. 15, 1977, Ser. No. 861,095
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 D

249,594
BACK PACK
Scott Stewart, c/o Stewart Designs, Inc. 901 Watson St., Madison, Wis. 53713
Filed Dec. 3, 1976, Ser. No. 747,293
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 R



249,595
FABRIC
Leo John Comensoli, Dural, and Gloria Dawn Smythe, Potts Point, both of Australia, assignors to Speedo Knitting Mills Pty, Limited
Filed Sep. 21, 1976, Ser. No. 725,261
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 EE



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF SEPTEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Sundman, Frey Viking, 4,115,186, Cl. 162-65.000.

A. B. Dick Company: *See*—
Bach, Frederick O.; Chapin, Leo N.; and Freed, Robert, 4,115,289, Cl. 252-62.10P.

A. E. Staley Manufacturing Company: *See*—
Young, Austin H.; and Verbanac, Frank, 4,115,332, Cl. 260-17.4GC.

A. H. Robins Company, Inc.: *See*—
Lunsford, Carl D.; and Cale, Albert D., Jr., 4,115,587, Cl. 424-324.000.

A/S Kjaettingfabriken: *See*—
Brynemo, Jan Jorgen; and Spilhaug, Tor William, 4,114,940, Cl. 294-82.00R.

A-T-O Inc.: *See*—
Carter, Sidney T., 4,115,179, Cl. 156-444.000.

Aaldenberg, Eric R.: *See*—
Jacobs, Maxwell E.; and Aaldenberg, Eric R., 4,114,709, Cl. 177-156.000.

AB Akerlund & Rausing: *See*—
Ekstrand, Stig, 4,115,176, Cl. 156-244.250.

Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, to Commissariat a l'Energie Atomique. Resilient metal gasket. 4,114,907, Cl. 277-206.00R.

Abe, Motoaki: *See*—
Aoki, Teruaki; and Abe, Motoaki, 4,114,254, Cl. 29-571.000.

Abe, Shingo: *See*—
Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, 4,115,516, Cl. 423-239.000.

Abels, Michael Allen, to Micro Tec Instrumentation, Inc. Medical and surgical implement detection system. 4,114,601, Cl. 128-1.00R.

Abex Corporation: *See*—
Frank, Earl E., 4,114,844, Cl. 246-162.000.

Aboshi, Yuzo: *See*—
Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, 4,115,439, Cl. 562-402.000.

ABU Aktiebolag: *See*—
Murvall, Ake Eugen, 4,114,825, Cl. 242-84.21R.

Acalor International Ltd.: *See*—
Bennett, John Reginald; and Greer, Kent R., 4,115,269, Cl. 210-150.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,114,636, Cl. 137-43.000.
Dugge, Richard H., 4,114,785, Cl. 222-545.000.
Malo, Lowell L., 4,114,935, Cl. 292-104.000.
Wempe, Richard J.; and Polley, Richard B., 4,114,783, Cl. 222-398.000.

Achelpohl, Fritz; and Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for making bags from a continuously fed thermoplastic tubular web of film. 4,114,520, Cl. 93-33.00H.

Achelpohl, Fritz; and Mundus, Friedhelm, to Windmoller & Holscher. Apparatus for making bags from a two-ply web of thermoplastic material. 4,115,183, Cl. 156-515.000.

Achenbach, Gary D.: *See*—
Maxson, Orwin G.; and Achenbach, Gary D., 4,115,606, Cl. 427-386.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed: *See*—
Metz, Paul; Schockmel, Robert; Nick, Desire; and Pfeiffer, Paul, 4,115,089, Cl. 65-19.000.

Ackerman, John P.: *See*—
Kinoshita, Kimio; and Ackerman, John P., 4,115,632, Cl. 429-188.000.

Adachi, Keiichi; Ikeda, Tadashi; and Tsujino, Nobuyuki, to Fuji Photo Film Co., Ltd. Internal latent image silver halide emulsion containing a heterocyclic quaternary salt having a propargyl or a butyryl containing substituent. 4,115,122, Cl. 96-76.00R.

Adams, Frank H.; and Knapik, H. Peter G., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,115,253, Cl. 208-139.000.

Adamson, James R., Jr., to United States of America, Army. Collector for hoist chain. 4,114,855, Cl. 254-175.500.

Adrian, Rudolf: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,115,393, Cl. 260-295.50R.

Aerojet-General Corporation: *See*—
Lista, Edwin L.; Hartupee, Richard B.; Manfred, Ralph K.; and O'Neil, Paul L., 4,115,166, Cl. 149-7.000.

Aerpat A.G.: *See*—
Jeal, Harvey Philip, 4,114,508, Cl. 85-41.000.

Aeschlimann, Peter, to Ciba-Geigy AG. Dry heat process for dyeing and printing organic material. 4,115,053, Cl. 8-2.50A.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Bonnemay, Maurice; Bronoel, Guy; Angely, Lysiane; and Peslerbe, Gilbert, 4,115,628, Cl. 429-44.000.
Guimbal, Jean, 4,115,712, Cl. 310-12.000.

Agency of Industrial Science & Technology: *See*—
Murata, Ryoji, 4,115,005, Cl. 356-120.000.

AGFA-Gevaert AG: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Zobel, Siegfried, 4,115,792, Cl. 354-213.000.
Fauth, Gunter; and Engelsmann, Dieter, 4,115,791, Cl. 354-206.000.
Liepold, August, 4,114,833, Cl. 242-199.000.
Mischo, Klaus; and Liermann, Traugott, 4,115,000, Cl. 355-29.000.
Mischo, Klaus; Liermann, Traugott; and Pustka, Karel, 4,115,001, Cl. 355-29.000.

Aglitsky, Vladimir Efimovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Ahmed, Quazi: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,115,393, Cl. 260-295.50R.

Ahrens, Gerd: *See*—
Kleineisel, Gustav; Kuchenbecker, Dietrich; and Ahrens, Gerd, 4,115,033, Cl. 417-216.000.

Aiba, Masahiko: *See*—
Fujimoto, Isao; Aiba, Masahiko; Yamamoto, Yoichi; and Makita, Tomoo, 4,115,787, Cl. 346-75.000.
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.

Aimar, Michele, to ITW Fastex Italia, S.p.A. Self-tapping wing nut. 4,114,506, Cl. 85-32.00W.

Air Industrie: *See*—
Denjean, Rene, 4,114,862, Cl. 266-44.000.

Air Products & Chemicals, Inc.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,115,634, Cl. 521-126.000.

Airflow Developments Limited: *See*—
Bagley, Peter Edward, 4,114,558, Cl. 116-114.0PV.

Aisan Kogyo Kabushiki Kaisha: *See*—
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, 4,114,576, Cl. 123-119.00A.

Aisin Seiki Company, Limited: *See*—
Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, 4,114,548, Cl. 112-258.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Sugiura, Teruo; Tsubouchi, Hiromitsu; Ishida, Nobuyasu; and Kobayashi, Kiyonori, 4,114,740, Cl. 192-70.180.

Aitel, Moe Lawrence, to Sanders Associates, Inc. Shielded passageway interconnection for electromagnetic interference shielded shelters. 4,115,656, Cl. 174-35.0MS.

Akahoshi, Takashi: *See*—
Masuda, Tetsuzo; Tagawa, Tomiyasu; Yoshioka, Hachiro; and Akahoshi, Takashi, 4,115,071, Cl. 422-179.000.

Akamatsu Alloy Tool Co., Ltd.: *See*—
Akamatsu, Motoji, 4,114,217, Cl. 10-85.000.

Akamatsu, Motoji, to Akamatsu Alloy Tool Co., Ltd. Die assembly. 4,114,217, Cl. 10-85.000.

Akanuma, Kiyohiko: *See*—
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.

Akao, Masatake: *See*—
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.

Akashi, Tetsuya; and Nikawa, Akio, to Topura Co., Ltd. (Kabushiki Kaisha Tohpura). Method for securing screw means onto metal plate and metal plate having screw means secured. 4,114,670, Cl. 151-41.720.

Akatsu, Mitsuharu, to Hitachi, Ltd. Automatic gain control circuit. 4,115,812, Cl. 358-174.000.

Akiyama, Nobuyuki; and Oshima, Yoshimasa, to Hitachi, Ltd. Alignment pattern detecting apparatus. 4,115,762, Cl. 340-146.30H.

Aktiebolaget Draco: *See*—
Wetterlin, Kjell Ingvar Leopold, 4,114,615, Cl. 128-173.00R.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt Arne Gunnar, 4,114,822, Cl. 242-47.010.

Aktiebolaget Leo: *See—*
Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,115,414, Cl. 260-397.500.

Akzo NV: *See—*
Havinga, Reginoldus; and Swaters, Pieter Dirk, 4,115,224, Cl. 204-159.180.

Akzona Incorporated: *See—*
Zengel, Hans; and Bergfeld, Manfred, 4,115,451, Cl. 260-566.00A.

Alamprese, Leo, to Honeywell Inc. Modulating plug valve. 4,114,850, Cl. 251-86.000.

Albats, Boris Samuilovich: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Alberghini, Alfred C.: *See—*
Morris, Frank R.; and Alberghini, Alfred C., 4,114,347, Cl. 53-300.000.

Alderfer, Richard Bernhard; and Scheibner, Gerald Harry, to Union Carbide Corporation. Apparatus for internally cooling a plastic tubular film bubble. 4,115,048, Cl. 425-72.00R.

Alexander, Eli James. Searchlight. 4,115,841, Cl. 362-44.000.

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich. Carrier for the pneumatic conveying of loads over a pipeline. 4,114,835, Cl. 243-32.000.

Alexandrov, Adolf Moritsovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Aley, Carl Lee, to Boeing Company, The. Container integrated work stand. 4,114,754, Cl. 206-319.000.

Alinari, Carlo. Fluid pressure transducer and pressure measuring instrument including the transducer. 4,114,458, Cl. 73-729.000.

Allegheny Ludlum Industries, Inc.: *See—*
Benford, James G.; and Bishop, Harry L., Jr., 4,115,160, Cl. 148-111.000.
Datta, Amitava, 4,115,161, Cl. 148-111.000.
Reen, Orville W., 4,115,158, Cl. 148-31.550.
Southern, Raymond L.; and Bishop, Harry L., 4,114,251, Cl. 29-527.700.

Allen, Billy R.: *See—*
Coughlin, Robert W.; Charles, Marvin; and Allen, Billy R., 4,115,198, Cl. 195-63.000.

Allen-Bradley Company: *See—*
Dummermuth, Ernst H., 4,115,853, Cl. 364-200.000.

Allied Chemical Corporation: *See—*
Cipris, Divna, 4,115,238, Cl. 204-290.00R.
Gancy, Alan B.; and Kaminski, Chester J., 4,115,219, Cl. 204-99.000.
Gancy, Alan B.; and Poncha, Rustom P., 4,115,525, Cl. 423-425.000.
Kavesh, Sheldon; and Bretts, Gerald R., 4,115,682, Cl. 219-118.000.
Lazarus, Stanley David; and Chakravarti, Kalidas, 4,115,350, Cl. 260-45.80A.
Ratcliffe, Charles T., 4,115,523, Cl. 423-387.000.
Smura, B. Bernard, 4,115,236, Cl. 204-254.000.

Allied Paper Incorporated: *See—*
Shaw, Michael J., 4,115,603, Cl. 427-326.000.

Allington, Robert William, to Instrumentation Specialties Company. Chemical analyzer. 4,115,861, Cl. 364-497.000.

Alsberg, Henry; Skalla, Dale W.; and Tirpak, Michael R., to Richardson Corporation. High impact polymer and process for its production. 4,115,478, Cl. 260-880.00R.

Aluminum Company of America: *See—*
Booz, Albert David; and Kondis, Thomas J., 4,115,107, Cl. 75-0.50R.
Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., 4,115,215, Cl. 204-67.000.
Hargis, Robert L., 4,115,214, Cl. 204-64.00R.

Alza Corporation: *See—*
Shell, John W., 4,115,544, Cl. 424-14.000.
Weinshenker, Ned M.; and Anderson, Niels H., 4,115,545, Cl. 424-45.000.

Amano, Toshio; and Kaku, Hidetoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Fail-safe oil feed control linkage for two cycle internal combustion engine. 4,114,587, Cl. 123-196.00S.

Amark Industries, Inc.: *See—*
Williams, David E.; and Hoyt, Edwin D., 4,115,686, Cl. 219-523.000.

Ambico Inc.: *See—*
Petillo, Phillip J., 4,114,503, Cl. 84-422.00S.

Amdahl Corporation: *See—*
Beall, Robert J.; and Zasio, John J., 4,115,837, Cl. 361-388.000.

American Can Company: *See—*
Crosdale, William H., 4,114,725, Cl. 181-205.000.

American Chain & Cable Company, Inc.: *See—*
Nicodemus, Robert N., Jr.; Bosler, James W.; and Kershner, Marvin R., 4,114,538, Cl. 104-88.000.

American Cyanamid Company: *See—*
Ellwanger, Richard Earl, 4,115,340, Cl. 260-29.6HN.
Lang, Stanley Albert, Jr.; and Walworth, Bryant Leonidas, 4,115,097, Cl. 71-92.000.
Paul, Rolf; and Menschik, Judith, 4,115,572, Cl. 424-249.000.

American Hospital Supply Corporation: *See—*
Driscoll, Richard C.; and Morejon, Clara B., 4,115,537, Cl. 424-1.000.
Lewyn, Lanny Louis; and Simpson, Glen David, 4,114,627, Cl. 128-419.0PT.
Rockett, Thomas J.; and O'Connell, John J., 4,115,487, Cl. 264-16.000.

American Optical Corporation: *See—*
Travnicek, Edward A., 4,114,993, Cl. 351-160.000.

Ameron, Inc.: *See—*
Robertson, Harry H., 4,114,332, Cl. 52-224.000.

Amisaki, Yumiko: *See—*
Kinoshita, Yoshikiyo; Aoi, Takashi; Kimura, Yoshihiro; and Amisaki, Yumiko, 4,115,480, Cl. 260-885.000.

Ammann, Hans Hugo; and Oien, Michael Ackman, to Bell Telephone Laboratories, Incorporated. Flexible circuit reflow soldering process and machine. 4,115,601, Cl. 427-96.000.

Ammco Tools, Inc.: *See—*
Spainhour, Phillip A.; Hampton, Robert S., Jr.; and Morrison, Leonard A., 4,114,283, Cl. 33-337.000.

AMP Incorporated: *See—*
Hansen, Niels Junior; Ward, John Ambrose; Hintze, William; and Johnson, David Charles, 4,115,750, Cl. 337-107.000.
Loomis, Phillip Eugene; Martz, Paul Elwood; and Phillips, Howard Charles, 4,114,253, Cl. 29-566.200.
Weidler, Charles Harry, 4,114,975, Cl. 339-176.00M.

Ampex Corporation: *See—*
Gooch, Beverley R., 4,115,827, Cl. 360-121.000.

AMSTED Industries Incorporated: *See—*
Strugielski, Ronald T.; and Mulcahy, Harry William, 4,114,540, Cl. 105-226.000.

Amtel, Inc.: *See—*
Sussmuth, Reiner W., 4,115,024, Cl. 407-114.000.

Anaconda Company, The: *See—*
Horton, Steven A., 4,115,840, Cl. 361-400.000.

Ancos Co., Ltd.: *See—*
Torii, Osamu, 4,115,015, Cl. 401-110.000.

Anderson, Clifton P.: *See—*
Wooding, Patrick J.; and Anderson, Clifton P., 4,115,654, Cl. 13-33.000.

Anderson, Joseph A., to Mertens, Benny F., a part interest. Inoculator. 4,115,200, Cl. 195-127.000.

Anderson, Niels H.: *See—*
Weinshenker, Ned M.; and Anderson, Niels H., 4,115,545, Cl. 424-45.000.

Ando, Hisashi: *See—*
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.

Andre, Thierry: *See—*
Melchior, Jean; and Andre, Thierry, 4,114,379, Cl. 60-606.000.

Andrepont, John S.: *See—*
Orndorff, James A., Jr.; Wozniak, Robert S.; and Andrepont, John S., 4,114,556, Cl. 114-230.000.

Andrews, Christopher Michael, to Ciba-Geigy Corporation. Polyhalocarboxylic acid salts as accelerators for curing epoxide resins. 4,115,296, Cl. 528-92.000.

Andrews, Peter. Motor vehicle oil drip pan apparatus device for at least indirectly saving lives and accidents on a highway. 4,114,717, Cl. 180-69.100.

Angely, Lysiane: *See—*
Bonnemay, Maurice; Bronoel, Guy; Angely, Lysiane; and Peslerbe, Gilbert, 4,115,628, Cl. 429-44.000.

Ansbaugh, Donald I.; and Heilman, Glenn A., to Heilman Enterprises, Inc. Terrain traversing device having impeller means for propelling grass clippings and leaves into a receptacle. 4,114,353, Cl. 56-13.300.

Anselrode, Lodewijk, to Stork Brabant B.V. Electrophoretic transfer process. 4,115,234, Cl. 204-180.00R.

Anshus, Byron E., to Chevron Research Company. Preparation of catalyst for the polymerization of 2-pyrrolidone. 4,115,399, Cl. 260-326.5FN.

Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich. Method for dimerization of olefins. 4,115,468, Cl. 260-683.15D.

Antonov, Andrei Alexandrovich: *See—*
Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,469, Cl. 260-683.15D.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,115,252, Cl. 208-139.000.

Antos, George J., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,115,254, Cl. 208-139.000.

Aoi, Takashi: *See—*
Kinoshita, Yoshikiyo; Aoi, Takashi; Kimura, Yoshihiro; and Amisaki, Yumiko, 4,115,480, Cl. 260-885.000.

Aoki, Aiko: *See—*
Kametani, Hiroshi; and Aoki, Aiko, 4,115,222, Cl. 204-117.000.

Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, to Nippon Kayaku Kabushiki Kaisha. Process for the preparation of optically active α-phenylglycine and intermediates thereof. 4,115,439, Cl. 562-402.000.

Aoki, Teruaki; and Abe, Motoaki, to Sony Corporation. Method for manufacture of a semiconductor device. 4,114,254, Cl. 29-571.000.

Aoki, Tooru: *See—*
Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, 4,115,117, Cl. 96-29.00D.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,114,577, Cl. 123-119.00A.

Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, to Nissan Motor Company, Limited. Valve operating mechanism of internal combustion engine. 4,114,643, Cl. 137-495.000.

Apparatebau Rothemuhle Brandt & Kritzler: *See—*
Kritzler, Gerhard; and Eckert, Paul, 4,114,680, Cl. 165-4.000.

Applegate, Barry George: *See—*
Davies, Robert William; and Applegate, Barry George, 4,114,355, Cl. 53-389.000.

Applied Radiation Corporation: *See—*
Stieber, Volker Adolf Wilhelm, 4,115,830, Cl. 361-187.000.

Arai, Yoshi: *See—*
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.

Araki, Tadashi: *See—*
Otani, Sugio; Watanabe, Shoji; and Araki, Tadashi, 4,115,527, Cl. 423-447.400.

Araoka, Toshinobu, to Toyo Denki Kogyosho Co., Ltd. Method and apparatus for transferring material with the use of a fluid. 4,114,955, Cl. 302-15.000.

Archer, Wesley L.: *See—*
Spencer, David R.; and Archer, Wesley L., 4,115,461, Cl. 260-652.50R.

Arco Industries Ltd.: *See—*
Chow, Thomas, 4,114,311, Cl. 46-192.000.

Arenco Machine Company: *See—*
Wildmoser, Martin Michael, 4,115,182, Cl. 156-515.000.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,115,476, Cl. 260-880.00R.

Arman S.p.A.: *See—*
Blackman, Ronald, 4,114,227, Cl. 15-250.320.

Armco Steel Corporation: *See—*
Beck, David E., 4,114,338, Cl. 52-478.000.
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,114,563, Cl. 118-63.000.

Armour and Company: *See—*
Skidmore, Lawrence M., 4,114,492, Cl. 83-367.000.

Armour Pharmaceutical Company: *See—*
Rubino, Andrew M.; and Margres, Jack J., 4,115,553, Cl. 424-155.000.

Armstrong Cork Company: *See—*
Bulson, Walter T.; Christie, Peter A.; and Jones, James R., 4,115,423, Cl. 260-429.500.

Arndt, Henry Clifford: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,453, Cl. 260-586.00G.

Arneklev, Duane R., to Stauffer Chemical Company. Antidote compositions and method of use with herbicides. 4,115,099, Cl. 71-93.000.

Arruda, Michael. Automobile oil changing device. 4,114,660, Cl. 141-98.000.

Art-Phyl Creations: *See—*
Hochman, Arthur, 4,114,763, Cl. 211-57.100.

Arzoumanian, Aram Sarkis, to Dataproducts Corporation. Impact printer magnet assembly. 4,114,532, Cl. 101-93.480.

Asahi Glass Company Ltd.: *See—*
Asawa, Tatsuro; and Gunjima, Tomoki, 4,115,240, Cl. 204-296.000.
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.

Asam, Adolf R.; and Maklad, Mokhtar S., to International Telephone and Telegraph Corporation. Low loss multilayer optical fiber. 4,114,980, Cl. 350-96.330.

Asamoto, Toshitaka: *See—*
Hashimoto, Yoshitoshi; Kondo, Takajiro; and Asamoto, Toshitaka, 4,114,491, Cl. 83-341.000.

Asaro, Vito F. Avalanche rescue marker system. 4,114,561, Cl. 116-124.00B.

Asawa, Tatsuro; and Gunjima, Tomoki, to Asahi Glass Company Ltd. Method of regenerating electrochemical properties of cation exchange membrane of fluorinated polymer. 4,115,240, Cl. 204-296.000.

ASEA Aktiebolag: *See—*
Gustavsson, Rolf; and Hedvall, Per, 4,115,262, Cl. 210-42.00S.

Ashfield, Herbert Edward, to David Brown Tractors Limited. Epicyclic gearing. 4,114,479, Cl. 74-801.000.

Ashton, Fraser E.: *See—*
Wallace, Rebecca; Ashton, Fraser E.; Perry, Malcolm B.; and Diena, Benito B., 4,115,543, Cl. 424-8.000.

Aspheric Associates, Ltd.: *See—*
Hooker, Derrell C., 4,114,486, Cl. 82-12.000.

Astier, Pierre Jean Baptiste. Locking device and means for actuating this device. 4,114,410, Cl. 70-339.000.

Aston Electronic Developments Ltd.: *See—*
Goff, Raymond Charles, 4,115,811, Cl. 358-167.000.

Athenstedt, Martin: *See—*
Dietzel, Walter; and Athenstedt, Martin, 4,115,145, Cl. 127-5.000.

Atlantic Richfield Company: *See—*
Sheng, Ming Nan; and Kao, Jar-lin, 4,115,440, Cl. 562-533.000.

Atlas Powder Company: *See—*
Machacek, Oldrich, 4,115,165, Cl. 149-5.000.

Atlas Tool & Manufacturing Co.: *See—*
White, Kenneth W., 4,114,471, Cl. 74-551.600.

Ato Chimie: *See—*
Foy, Paul; and Kern, Rene, 4,115,475, Cl. 260-857.0PE.

Atwater, Jerrold Bradford, to Lockheed Electronics Co., Inc. Plural load power controller with time-shared processor. 4,115,860, Cl. 364-492.000.

Auborn, James J.; and Trickett, Elizabeth A., to GTE Laboratories Incorporated. Process for the preparation of reactive tungsten and derivatives thereof. 4,115,526, Cl. 423-440.000.

Aust, John J., to Owens-Illinois, Inc. Reinforced form-fitting shipping container. 4,114,755, Cl. 206-326.000.

Austin, Forrest L.; and Cornelius, Richard T., to Black and Decker Manufacturing Company, The. Spray nozzle. 4,114,812, Cl. 239-492.000.

Auto-Chlor Inc.: *See—*
James, Robert Frederic, 4,115,263, Cl. 210-60.000.

Automotive Products Limited: *See—*
Rawlings, Dennis George, 4,114,742, Cl. 192-89.00B.

Avedis Zildjian Company: *See—*
Zildjian, Armand A., 4,114,502, Cl. 84-402.000.

Avery, Noyes L., to Rohm and Haas Company. Selective removal of iron cyanide anions from fluids containing thiocyanates. 4,115,260, Cl. 210-34.000.

Avicon Development Group: *See—*
Pratt, Wayne L., 4,114,442, Cl. 73-341.000.

Avmar, Incorporated: *See—*
DiCecio, Salvatore A., 4,115,756, Cl. 340-27.00R.

Axtell, Clyde R., III, to Digital Facilities, Inc. System for locating electrical shorts by tracking the paths of injected pulse currents utilizing a voltage differential responsive probe. 4,115,731, Cl. 324-52.000.

Axtell, Martin John Shelley, executor: *See—*
Selwood, Peter Richard, deceased; Selwood, Timothy John, executor; Axtell, Martin John Shelley, executor; and Burton, John David, 4,115,041, Cl. 417-440.000.

AZO-Maschinenfabrik Adolf Zimmermann: *See—*
Link, Otmar; and Nied, Gerhard, 4,114,324, Cl. 52-2.000.

B. F. Goodrich Company, The: *See—*
Hartitz, Joachim Ernst, 4,115,495, Cl. 264-90.000.

B/W Metals Company, Inc.: *See—*
Weddendorf, Elmer R., 4,114,541, Cl. 108-20.000.

Babb, Burton A., to Babbco, Ltd. Loudspeaker voice coil bearing. 4,115,667, Cl. 179-115.5VC.

Babbco, Ltd.: *See—*
Babb, Burton A., 4,115,667, Cl. 179-115.5VC.

Babcock & Wilcox Company, The: *See—*
Butti, James Paul, 4,115,194, Cl. 176-87.000.

Babin, Gennady Andreevich: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Baboff, Leon Ian; Shichman, Daniel; and Reed, Lawrence Paul, to Uniroyal, Inc. Apparatus and method for applying puncture sealant material to a tire. 4,115,172, Cl. 156-115.000.

Bach, Frederick O.; Chapin, Leo N.; and Freed, Robert, to A. B. Dick Company. Dry powdered or liquid developer compositions. 4,115,289, Cl. 252-62.10P.

Bach, Hartwig C., to Monsanto Company. Novel process for the preparation of fiber of arylene oxadiazole/arylene N-alkylhydrazide copolymer. 4,115,503, Cl. 264-184.000.

Bachhofer, Bruno; Locher, Anton; Skirde, Gerhard; and Quistorff, Hansjorg. Apparatus for treating and degerminating bath water, particularly bath water contaminated by the germ bact. *pseudomonas pyocanea,* in medical tub-baths and underwater massage baths. 4,115,267, Cl. 210-136.000.

Bacon, John E.: *See—*
Hough, Robert J.; and Bacon, John E., 4,114,784, Cl. 220-408.000.

Badgley, Charles G., to Badgley, Richard B. Overhead roof-mounted rear view mirror. 4,114,989, Cl. 350-302.000.

Badgley, Richard B.: *See—*
Badgley, Charles G., 4,114,989, Cl. 350-302.000.

Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., to Hydra Corporation. Printer

system having local control for dynamically alterable printing. 4,114,750, Cl. 400-279.000.

Baecke, Antoine Marinus Rene: *See—*
Oosterling, Pieter Adriaan; and Baecke, Antoine Marinus Rene, 4,114,814, Cl. 239-689.000.

Bagley, Peter Edward, to Airflow Developments Limited. Measuring instrument indicating mechanism. 4,114,558, Cl. 116-114.0PV.

Bailey, Robert L. Cake cutter and server. 4,114,265, Cl. 30-122.000.

Bainard, Dean R., to Garlock Inc. Pressure shaft seal method. 4,114,245, Cl. 29-156.40R.

Bainard, Dean R., to Garlock Inc. Method for installing seal over splined shaft. 4,114,897, Cl. 277-1.000.

Bainard, Dean R.; and Wright, Roger W., to Garlock Inc. Oil seal with permanently deformable locking member. 4,114,898, Cl. 277-9.000.

Baird-Atomic, Inc.: *See—*
Demers, Donald R., 4,115,063, Cl. 23-230.00M.

Baker International Corporation: *See—*
Beall, William R., 4,114,421, Cl. 73-17.00R.

Baker, Melvin Charles, to E.I. DuPont de Nemours and Company. Conversion of poly(tetramethylene ether) glycol in aqueous effluent stream to tetrahydrofuran. 4,115,408, Cl. 260-346.110.

Balaian, Ruben Dzhangirovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Balcerak, Raymond S.; and Garn, Lynn E., to United States of America, Army. Solid state readout device for a two dimensional pyroelectric detector array. 4,115,692, Cl. 250-338.000.

Baldwin, Bernard A.; Williams, Ralph P.; and Rohde, Raymond, to Phillips Petroleum Company. Lubricant antiwear additives containing sulfur and boron. 4,115,286, Cl. 252-46.300.

Ball, Peter: *See—*
Goodacre, John Purefoy; Potter, Colin; and Ball, Peter, 4,114,662, Cl. 141-387.000.

Ballard, Joseph E.: *See—*
Gragson, James T.; and Ballard, Joseph E., 4,115,562, Cl. 264-234.000.

Ballas, George Charles, Sr., to Weed Eater, Inc. Rotary cutting assembly. 4,114,269, Cl. 30-276.000.

Bamberg, Wolfgang: *See—*
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,115,443, Cl. 562-402.000.

Bandag Incorporated: *See—*
Dundon, Michael J., 4,115,171, Cl. 156-96.000.

Banno, Hideo: *See—*
Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, 4,114,548, Cl. 112-258.000.

Banucci, Eugene G.: *See—*
Boldebuck, Edith M.; and Banucci, Eugene G., 4,115,341, Cl. 260-33.20R.

Barbe, Karl-Heinz, to Hauni-Werke Korber & Co. Kg. Apparatus for expelling gases from liquid adhesives. 4,115,085, Cl. 55-193.000.

Barbe, Pier Camillo: *See—*
Scata, Umberto; Luciani, Luciano; and Barbe, Pier Camillo, 4,115,319, Cl. 252-429.00B.

Barker, George E.: *See—*
Unland, Mark L.; and Barker, George E., 4,115,424, Cl. 252-432.000.

Barker, Harold Reed. Solar energy collector and glazing system. 4,114,595, Cl. 126-270.000.

Barmag Barmer Maschinenfabrik AG: *See—*
Berges, Dietrich; Damzog, Bodo; and Saam, Ulrich, 4,114,361, Cl. 57-156.000.

Bartek, Joseph P.; Dolhyj, Serge R.; Velenyi, Louis J.; and Grasselli, Robert K., to Standard Oil Company, The. Process for preparing diarylethylenes. 4,115,464, Cl. 260-668.00C.

Bartels, Gunter; Immenroth, Horst; and Heyer, Gunter, to Preussag Aktiengesellschaft Metall. Process for the preparation of high purity antimony. 4,115,220, Cl. 204-105.00R.

Bartels, Manfred, to Empisal Knitmaster Luxembourg S.A. Control unit for a hand knitter. 4,114,405, Cl. 66-75.200.

Barth, Rudolph; and Jaeger, Oskar, to Behringwerke Aktiengesellschaft. Rabies vaccine preparation. 4,115,195, Cl. 195-1.300.

Barth, Wayne E., to Pfizer Inc. Antibacterial 3-(5-tetrazolyl) penam compounds. 4,115,385, Cl. 260-239.100.

BASF Aktiengesellschaft: *See—*
Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, 4,115,638, Cl. 526-61.000.
Gall, Ludwig; and Fabian, Wolfgang, 4,115,386, Cl. 260-281.00P.
Oppenlaender, Knut; Seib, Karl; and Krapf, Heinz, 4,115,314, Cl. 252-309.000.

BASF Wyandotte Corporation: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,115,281, Cl. 252-8.800.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,115,281, Cl. 252-8.800.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,115,281, Cl. 252-8.800.
Krumpelt, Michael, 4,115,218, Cl. 204-98.000.

Bataeva, Ljubov Petrovna: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Batzar, Kenneth, to Du Pont de Nemours, E. I., and Company. Dust-free thermally stable lead chromate pigment composition and process of preparation. 4,115,143, Cl. 106-298.000.

Bauer, Heinrich Franz; Eichinger, Anton; and Feitzelmayer, Ernst, to Motoren-und Turbinen-Union Munchen GmbH. Method of applying miniaturized high-temperature free-grid strain gauges. 4,115,174, Cl. 156-155.000.

Baum, Burton M.: *See—*
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,115,058, Cl. 8-111.000.
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,115,060, Cl. 8-111.000.

Baumgartner, Heinrich, to BBS-Kraftfahrzeugtechnik GmbH & Co. KG. Motor vehicle wheel. 4,114,953, Cl. 301-63.0DD.

Bausch & Lomb Incorporated: *See—*
Morton, Roger R. A., 4,115,803, Cl. 358-107.000.
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,115,804, Cl. 358-107.000.
Morton, Roger R. A., 4,115,805, Cl. 358-107.000.
Morton, Roger R. A., 4,115,806, Cl. 358-107.000.

Baxter Travenol Laboratories, Inc.: *See—*
Brown, Richard I., 4,114,802, Cl. 233-26.000.

Bayer Aktiengesellschaft: *See—*
Bien, Hans-Samuel; Klauke, Erich; and Wunderlich, Klaus, 4,115,378, Cl. 260-146.00T.
Bier, Peter; and Binsack, Rudolf, 4,115,371, Cl. 528-279.000.
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 4,115,261, Cl. 210-40.000.
Elfert, Klaus; Rosenkranz, Hans Jurgen; and Rudolf, Hans, 4,115,465, Cl. 260-674.00R.
Henes, Gerhard; Muller, Hans Jurgen; Gupta, Pramod; and Zirner, Joachim, 4,115,373, Cl. 528-48.000.
Hohmann, Walter; and Kuhnel, Werner, 4,115,412, Cl. 260-380.000.
Kubens, Rolf; and Meyer, Frank, 4,114,382, Cl. 405-264.000.
Linhart, Karl; and Friedrich, Adolf, 4,115,652, Cl. 568-706.000.
Maurer, Fritz; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,115,542, Cl. 424-200.000.
Meyborg, Holger, 4,115,320, Cl. 252-431.00C.
Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, 4,115,379, Cl. 260-163.000.
Raue, Roderich; Eifler, Willi; and Kuhlthau, Hans-Peter, 4,115,413, Cl. 260-390.000.
Schneider, Gottfried; Wagner, Kuno; and Patzelt, Heinz Wolfgang, 4,115,298, Cl. 260-2.300.
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,115,462, Cl. 260-667.000.

Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, to Radiochemical Centre Limited, The. Saturation analysis of folate compound with selenium-75 labeled folate. 4,115,065, Cl. 23-230.600.

Bazen, Badger R. Stacking racks. 4,114,343, Cl. 52-665.000.

BBC Brown Boveri & Company Limited: *See—*
Oberle, Arthur, 4,114,651, Cl. 137-630.140.
Oberle, Arthur, 4,114,652, Cl. 137-630.140.

BBS-Kraftfahrzeugtechnik GmbH & Co. KG: *See—*
Baumgartner, Heinrich, 4,114,953, Cl. 301-63.0DD.

Beal, Steven G.; Ceballos, Arthur; and Ceballos, Dolores D. Worm harvesting. 4,114,762, Cl. 209-78.000.

Beall, Robert J.; and Zasio, John J., to Amdahl Corporation. LSI Chip package and method. 4,115,837, Cl. 361-388.000.

Beall, William R., to Baker International Corporation. Apparatus for measuring the concentration of impurities within a substance. 4,114,421, Cl. 73-17.00R.

Beatrice Foods Co.: *See—*
Jordan, J. Kirk, 4,115,595, Cl. 426-250.000.
Zavagli, Steven B.; and Kasik, Robert L., 4,115,376, Cl. 260-120.000.

Beauvais, Thierry; and Souchay, Philippe, to Thomson-CSF. High-speed correlating device. 4,115,865, Cl. 364-604.000.

Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., to Air Products & Chemicals, Inc. Amine salts of amino acids as delayed action catalysts. 4,115,634, Cl. 521-126.000.

Bechet, Henri L. J.; and Vertongen, Jose J. A., to Westinghouse Electric Corp. Electrical switchboard framework. 4,114,336, Cl. 52-280.000.

Beck, David E., to Armco Steel Corporation. Reinforcing plate for overlapped joints. 4,114,338, Cl. 52-478.000.

Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, to BASF Aktiengesellschaft. Process for letting down ethylene high pressure polymerization systems. 4,115,638, Cl. 526-61.000.

Beckman, Paul. Partial oxygen measurement system. 4,115,230, Cl. 204-195.00R.

Bedenbender, John William: *See—*
Weber, Richard Martin; and Bedenbender, John William, 4,114,722, Cl. 181-114.000.

Beech, Keith James William, to Lucas Industries Limited. Method of making a stator assembly. 4,114,258, Cl. 29-596.000.

Beecham Group Limited: *See*—
Bentley, Peter Hubert; and Brooks, Gerald, 4,115,646, Cl. 544-27.000.
Beelow, Ralph E. Pontoon boat trailer. 4,114,772, Cl. 214-512.000.
Beernaerts, Andre M. H. J.; and Eskes, Hendrik J. K., to International B. F. Goodrich-Europe B.V. Method for manufacturing essentially wrinkle-free foamed articles with an upholstery material adhering thereto and resultant article. 4,114,213, Cl. 5-345.00R.
Beeskow, Bruno: *See*—
Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, 4,114,472, Cl. 74-574.000.
Behle, Gunter R., to ACF Industries, Incorporated. Bottom operable air inlet and outlet valve. 4,114,636, Cl. 137-43.000.
Behling, Harvey L., to Energy Development Associates. Halogen hydrate formation from halogen and finely divided aqueous droplets. 4,115,529, Cl. 423-472.000.
Behringwerke Aktiengesellschaft: *See*—
Barth, Rudolph; and Jaeger, Oskar, 4,115,195, Cl. 195-1.300.
Bejed, Inc.: *See*—
Johnson, Bill E.; and Dannenmann, John E., Jr., 4,115,849, Cl. 340-147.0CV.
Belgorodskaya, Olga Izrailevna: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Belgorodsky, Izrail Markovich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Bell & Howell Company: *See*—
Putnam, Hubert P.; and Butts, William O., 4,115,869, Cl. 364-900.000.
Bell, Ronald L., to Varian Associates, Inc. Concentrator arrangement for photovoltaic cell. 4,115,149, Cl. 136-89.0PC.
Bell Telephone Laboratories, Incorporated: *See*—
Ammann, Hans Hugo; and Oien, Michael Ackman, 4,115,601, Cl. 427-96.000.
Kasper, Horst Manfred; Tell, Benjamin; and Wagner, Sigurd, 4,115,633, Cl. 429-191.000.
Smith, George Elwood, 4,115,766, Cl. 340-347.0AD.
Thibault, Louis Robert; and Dy Yau, Leopoldo, 4,114,256, Cl. 29-571.000.
Bellavance, David Walter, to Texas Instruments Incorporated. Method of fabrication of a monolithic integrated optical circuit. 4,114,257, Cl. 29-572.000.
Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. Substituted 2-higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters and their use as miticides. 4,115,584, Cl. 424-301.000.
Bellissant, Alain: *See*—
Reymond, Jean-Claude; and Bellissant, Alain, 4,115,006, Cl. 356-152.000.
Belson, Alfred. Carrying pack for photography equipment. 4,114,667, Cl. 150-1.000.
Ben Gurion University of the Negev Research & Development Authority: *See*—
Sandler, Benzion, 4,114,453, Cl. 73-517.00R.
Bendix Corporation, The: *See*—
Marchak, Roman O.; and Drellishak, Glen J., 4,114,570, Cl. 123-32.0EG.
Tresselt, Carl P., 4,115,774, Cl. 343-17.700.
Benedict, John Pinhas: *See*—
Jankelewitz, Eliezer; and Benedict, John Pinhas, 4,114,933, Cl. 292-37.000.
Benford, James G.; and Bishop, Harry L., Jr., to Allegheny Ludlum Industries, Inc. Electromagnetic silicon steel from thin castings. 4,115,160, Cl. 148-111.000.
Benjamin, Ben E. Tension relieving device. 4,114,612, Cl. 128-76.00R.
Benkoe, Erwin: *See*—
Goldfarb, Adolph E.; and Benkoe, Erwin, 4,114,877, Cl. 273-1.00R.
Bennett, John Reginald; and Greer, Kent R., to Acalor International Ltd. Random packing materials. 4,115,269, Cl. 210-150.000.
Bennett, William C.: *See*—
Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., 4,114,750, Cl. 400-279.000.
Benoit, Roland A., to InterRoyal Corporation. Seating arrangement. 4,114,949, Cl. 297-445.000.
Benson, Alan R.: *See*—
Turner, Thomas D.; and Benson, Alan R., 4,114,617, Cl. 128-214.00R.
Bentley, Peter Hubert; and Brooks, Gerald, to Beecham Group Limited. Process for preparing 7-aminocephalosporanic acid derivatives. 4,115,646, Cl. 544-27.000.
Beran, Anthony V. Intubation set. 4,114,626, Cl. 128-348.000.
Berezovsky, Victor Leontjevich: *See*—
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.
Berger, Gerard: *See*—
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.
Berges, Dietrich; Damzog, Bodo; and Saam, Ulrich, to Barmag Barmer Maschinenfabrik AG. Twisting machine process for stranding wires. 4,114,361, Cl. 57-156.000.
Bergfeld, Manfred: *See*—
Zengel, Hans; and Bergfeld, Manfred, 4,115,451, Cl. 260-566.00A.
Bergmann, Gunther: *See*—
Otte, Wilhelm; Bergmann, Gunther; and Kubitza, Kar-Heinz, 4,115,265, Cl. 210-68.000.
Bergquist, Dwight H.; Cunningham, Franklin E.; and Eggleston, Robert M., to Henningsen Foods Inc. Instant dissolving egg white. 4,115,592, Cl. 426-32.000.
Bergsbaken, Jack L.: *See*—
Hultman, David P.; and Bergsbaken, Jack L., 4,115,605, Cl. 427-377.000.
Berlik, Lee; and Hurley, James E., to McGraw-Edison Company. Optional discharge oven vent. 4,114,589, Cl. 126-21.00R.
Bernard, Pierre Jean, to La Telemecanique Electrique. Mounting plate. 4,114,848, Cl. 248-346.000.
Bernstein, Max Jeremie, to Bremat S.A. Aluminum plating process. 4,115,604, Cl. 427-329.000.
Berry, Harry E. Pump coupling system for attachment to drum. 4,114,782, Cl. 222-382.000.
Berry, Robert W.: *See*—
Webb, Daniel R.; Steinke, John R.; Berry, Robert W.; and Funsten, Stanard R., 4,114,698, Cl. 173-1.000.
Bertone, Antonino: *See*—
Cattaneo, Maurizio; and Bertone, Antonino, 4,114,376, Cl. 60-548.000.
Besenfelder, Edward Roald, to Honeywell Information Systems Inc. Multiple bit deskew buffer. 4,115,759, Cl. 340-146.10F.
Bethlehem Steel Corporation: *See*—
Hitzrot, Henry W., Jr., 4,115,076, Cl. 51-295.000.
Roe, Gerald J., 4,115,155, Cl. 148-12.00F.
Beusink, Bernard Joseph, deceased: *See*—
Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and De Haan, Friedrich Jacobus, administrator, 4,114,406, Cl. 68-24.000.
Bibbee, Jeffrey N.: *See*—
Smith, Thomas W.; and Bibbee, Jeffrey N., 4,115,046, Cl. 425-29.000.
BICC Limited: *See*—
Martin, David Joseph, 4,115,087, Cl. 65-3.00C.
Bickel, Hans: *See*—
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,115,566, Cl. 424-246.000.
Biddlecom, William Gerard: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,453, Cl. 260-586.00G.
Bien, Hans-Samuel; Klauke, Erich; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Soluble reactive azodyestuffs containing a fluorotriazinyl group attached via a nitrogen bridge to the dyestuff molecule. 4,115,378, Cl. 260-146.00T.
Bier, Albert; and Vogelgesang, Herbert, to Moeller & Neumann GmbH. Rolling disc attachment. 4,114,416, Cl. 72-238.000.
Bier, Peter; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Stabilization of polycondensates of polyethylene terephthalate. 4,115,371, Cl. 528-279.000.
Biermans, Andreas J.; and Jonckers, Kees, to Unie Van Kunstmestfabrieken, B.V. Process for preparing a urea solution from ammonia and carbon dioxide. 4,115,449, Cl. 260-555.00A.
Bigelow, John Howard, to Du Pont de Nemours, E. I., and Company. Organophosphine sulfides as photographic sensitizers. 4,115,129, Cl. 96-107.000.
Bigi, Leonardo. Method for regenerating dialysing liquids in hemodialysis systems. 4,115,259, Cl. 210-22.00A.
Bikbau, Marsel Yanovich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.
Nudelman, Boris Izrailovich; Sventsitsky, Alexandr Sergeevich; Bikbau, Marsel Yanovich; Bun, Isaak Mozesovich; and Kevvai, Arnold Arnoldovich, 4,115,138, Cl. 106-100.000.
Billeter, Henry R., to Sloan Valve Company. Lead screw tapping

arrangement for use with self-opening die heads and collapsible taps. 4,115,026, Cl. 408-10.000.

Bindicator Company: *See—*
Zepp, Lawrence C.; and Mosteller, Marston D., 4,115,009, Cl. 356-201.000.

Bingham, Lowell. Dryers for lettuce and like salad components. 4,114,286, Cl. 34-58.000.

Binsack, Rudolf: *See—*
Bier, Peter; and Binsack, Rudolf, 4,115,371, Cl. 528-279.000.

Bishop, Harry L.: *See—*
Southern, Raymond L.; and Bishop, Harry L., 4,114,251, Cl. 29-527.700.

Bishop, Harry L., Jr.: *See—*
Benford, James G.; and Bishop, Harry L., Jr., 4,115,160, Cl. 148-111.000.

Bishop, Marilyn. Sterile port structure. 4,114,669, Cl. 150-8.000.

Bisping, Heinz, to Hilti Aktiengesellschaft. Interlocking clamps for piping and cable. 4,114,241, Cl. 24-81.0CC.

Bitson, Joseph W., to General Dynamics Corporation. Moving magnet miniature angular rate sensor. 4,114,452, Cl. 73-504.000.

Bitson, Joseph W.: *See—*
Crittenden, Jack H.; and Bitson, Joseph W., 4,114,451, Cl. 73-504.000.

Bitterlin, Albert: *See—*
Kirner, Hans Dieter; Bitterlin, Albert; and Muller, Ekkehard Walter, 4,115,055, Cl. 8-26.000.

Bjalme, Bengt G.: *See—*
Coblitz, Sanford E.; and Bjalme, Bengt G., 4,114,485, Cl. 82-4.00C.

Bjerklie, John W., to Hague International. Radiation reflecting door for process furnace. 4,115,051, Cl. 432-3.000.

Bjermo, Gote Herbert Egard; and Tresjo, Paul Einar, to System AB Infotenik. Sludge film conveying device. 4,114,753, Cl. 198-608.000.

Blach, James P. Water-flow control device and method. 4,114,204, Cl. 4-324.000.

Black and Decker Manufacturing Company, The: *See—*
Austin, Forrest L.; and Cornelius, Richard T., 4,114,812, Cl. 239-492.000.

Blackman, Ronald, to Arman S.p.A. Connection between a windshield wiper blade and the oscillating arm carrying it. 4,114,227, Cl. 15-250.320.

Blahunka, Charles Stephen. Omnidirectional visual vehicular warning system. 4,115,757, Cl. 340-32.000.

Blahut, Edward J., to Kapcoa Corp. Automatic locking and support device for high mast lighting structure. 4,115,845, Cl. 362-403.000.

Blanchard, William B.; and Ryan, Charles W., to Eli Lilly and Company. Preparation of cis-1-hydroxy-3-substituted-6,6-dimethyl-6,6a,7,8,10,10a-hexahydro-9H-dibenzo [b,d]pyran-9-ones and intermediates therefor. 4,115,403, Cl. 260-340.90R.

Blanton, William A., Jr.; and Flanders, Robert L., to Chevron Research Company. Process for removing sulfur from a gas. 4,115,249, Cl. 208-120.000.

Blanton, William A., Jr.: *See—*
Flanders, Robert L.; and Blanton, William A., Jr., 4,115,250, Cl. 208-120.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,115,251, Cl. 208-120.000.

Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., to Lectric Lites Company. Mounting apparatus for vehicle emergency warning signal. 4,114,789, Cl. 224-42.10E.

Blaylock, Tommey J. Clutch throw-out bearing plate. 4,114,744, Cl. 192-98.000.

Bleha, William P., Jr.; and Grinberg, Jan, to Hughes Aircraft Company. Visible-to-infrared converter light valve. 4,114,991, Cl. 350-338.000.

Bloching, Helmut: *See—*
Krause, Horst-Jurgen; Hase, Christian; and Bloching, Helmut, 4,115,309, Cl. 252-186.000.

Bloker, Richard T. Protective plug for the ends of tubular cores. 4,114,655, Cl. 138-89.000.

Blount, David H. Process for the production of poly (allyl halide allyl alcohol) polymer. 4,115,635, Cl. 526-29.000.

Blu-Surf, Inc.: *See—*
Flynn, Charles S., 4,115,052, Cl. 432-72.000.

Bluhm, Vernon A., to Burroughs Corporation. Amorphous semiconductor memory device for employment in an electrically alterable read-only memory. 4,115,872, Cl. 365-163.000.

Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., to FMC Corporation. Aromatic sulfonic anhydrides as peroxygen activators. 4,115,058, Cl. 8-111.000.

Blumbergs, John H.; and Scholer, Fred R., to FMC Corporation. Aromatic sulfonyl fluorides as peroxygen activators. 4,115,059, Cl. 8-111.000.

Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich. Method of dimerization of olefins. 4,115,469, Cl. 260-683.15D.

Boddeker, Karl W.; and Hilgendorff, Walter, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Apparatus for desalinating water by reverse osmosis. 4,115,274, Cl. 210-321.00R.

Bodenseewerk: *See—*
Krogmann, Uwe, 4,114,437, Cl. 73-178.00R.

Bodor, Nicolae S.: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,115,588, Cl. 424-325.000.

Bodyagina, Rashida Gafievna: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Boehler, William L., to Partnership of W. L. Boehler and A. G. Whaley Co., Inc., The. Guide for filamentary material. 4,114,829, Cl. 242-157.00R.

Boeing Company, The: *See—*
Aley, Carl Lee, 4,114,754, Cl. 206-319.000.
Carolan, Raymond Jerome, 4,114,203, Cl. 4-317.000.
Perkins, Donald Leroy; and Streckenbach, Bruce Lindsay, 4,114,930, Cl. 285-334.500.

Boenke, Clyde A.: *See—*
Means, David K.; and Boenke, Clyde A., 4,114,730, Cl. 187-29.00R.

Boese, Gunter; Neudorfer, Ernst; and Schollmeier, Gero, to Siemens Aktiengesellschaft. Circuit arrangement for controlling the pulse repetition frequency of a signal. 4,115,687, Cl. 235-92.0DM.

Boettcher, Edward G. Boat fastening means. 4,114,920, Cl. 280-414.00R.

Bogensberger, Joseph. Feeding bottle holder. 4,114,847, Cl. 248-104.000.

Boger, Manfred; and Kristiansen, Odd, to Ciba-Geigy Corporation. N-phenyl-N'methyl-N"-(O,S-dialkylphosphonyl)-1,3,5-triazapenta-1,4-dienes as pesticides. 4,115,561, Cl. 424-211.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Pesticidal sulphenylated formamidine compounds. 4,115,583, Cl. 424-300.000.

Boggs, Roger L., to Caterpillar Tractor Co. Replaceable wear members for an endless track. 4,114,958, Cl. 305-56.000.

Boginsky, Vladimir Petrovich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich, 4,114,700, Cl. 175-19.000.

Bohen, Joseph Michael; and Toukan, Sameeh Said, to Pennwalt Corporation. Heat stabilizer composition for halogenated resins. 4,115,352, Cl. 260-45.75B.

Bohmrich, Jack L.; Bowden, William A., Jr.; and Pedersen, Vernon G., to Dacor Corporation. Constant volume buoyancy compensator. 4,114,389, Cl. 405-186.000.

Boise Cascade Corporation: *See—*
Hough, Robert J.; and Bacon, John E., 4,114,784, Cl. 220-408.000.

Boksay, Istvan: *See—*
Weber, Rolf-Ortwin; Soder, Alfons; and Boksay, Istvan, 4,115,569, Cl. 424-250.000.

Boldebuck, Edith M.; and Banucci, Eugene G., to General Electric Company. Polyetheramide-acid-imide solution and process for preparation thereof. 4,115,341, Cl. 260-33.20R.

Bolkhovets, Basia Moiseevna: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Bolto, Brian Alfred; and Eppinger, Kurt Hermann, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Thermally regenerable amphoteric ion exchangers prepared by sequential treatment of polymeric beads with two reagents of opposing acid base character. 4,115,297, Cl. 521-32.000.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,114,696, Cl. 172-59.000.

Bomar, Lucien C., II: *See—*
Roeder, Robert S.; and Bomar, Lucien C., II, 4,115,776, Cl. 343-100.0ME.

Bondi, Pasquale Columbo, to General Electric Company. Spool type metering valve. 4,114,857, Cl. 251-324.000.

Boni, Joseph C.: *See—*
Schroeder, Walter W.; Sears, Noel C.; and Boni, Joseph C., 4,115,600, Cl. 427-79.000.

Bonnemay, Maurice; Bronoel, Guy; Angely, Lysiane; and Peslerbe, Gilbert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrode comprising a nickel based catalyst for electrochemical generators. 4,115,628, Cl. 429-44.000.

Bonnette, Rene W.: *See—*
Prince, Ronald E.; and Bonnette, Rene W., 4,114,510, Cl. 89-12.000.

Bonnington, Michael Glynn: *See—*
Kendall-Smith, Brian John; and Bonnington, Michael Glynn, 4,115,509, Cl. 264-331.000.

Booz, Albert David; and Kondis, Thomas J., to Aluminum Company of America. Method of producing metal flake. 4,115,107, Cl. 75-0.50R.

Borg, John P. Plug release mechanism. 4,114,969, Cl. 339-45.00R.

Borg-Warner Corporation: *See—*
Clauss, Julius Alphonse, 4,114,478, Cl. 74-781.00R.
Lindquist, Terry Kent, 4,114,741, Cl. 192-89.00B.
van Hesden, Jan Willem, 4,115,285, Cl. 252-32.500.

Wentworth, Robert S., Jr., 4,114,904, Cl. 277-88.000.
Wiese, Winfred John, 4,114,900, Cl. 277-27.000.

Borho, Klaus: *See—*
Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, 4,115,638, Cl. 526-61.000.

Borner, Gerhard: *See—*
Stieringer, Albert; and Borner, Gerhard, 4,114,995, Cl. 352-171.000.

Boronosky, Richard A.: *See—*
Yagusic, George J.; and Boronosky, Richard A., 4,115,838, Cl. 361-388.000.

Bosler, James W.: *See—*
Nicodemus, Robert N., Jr.; Bosler, James W.; and Kershner, Marvin R., 4,114,538, Cl. 104-88.000.

Bost, Howard W., to Phillips Petroleum Company. Triphenylphosphine oxide as a promoter for phosphorus-containing flame retardant. 4,115,349, Cl. 260-45.8NT.

Bostick, Hoyt A.; Sutton, Paul M.; and Richards, Chester L., to United States of America, Air Force. Buried grating shared aperture device. 4,114,978, Cl. 350-1.700.

Botte, Anthony Joseph, to International Business Machines Corporation. Collation controls. 4,114,871, Cl. 271-173.000.

Boulet, William Paul. Dryer system. 4,114,289, Cl. 34-173.000.

Bouplon, Edward J., to Chicago Pneumatic Tool Company. Drill rod table bushing arrangement. 4,114,701, Cl. 175-84.000.

Bourggraff, Robert; and Coulon, Jean-Claude, to Saint-Gobain Industries. Method and apparatus for manufacturing glass ribbon on a float bath. 4,115,091, Cl. 65-99.00A.

Bouy, Pierre; and Ravier, Dominique, to Rhone-Poulenc Industries. Coated anode. 4,115,239, Cl. 204-290.00F.

Bovio, Robert J.; and Mercaldi, Renaldo, to GTE Sylvania Incorporated. Rotary seal for vacuum and pressure systems. 4,114,903, Cl. 277-81.00R.

Bowden, William A., Jr.: *See—*
Bohmrich, Jack L.; Bowden, William A., Jr.; and Pedersen, Vernon G., 4,114,389, Cl. 405-186.000.

Bowen, Charles E. Turnbuckle wrench for tensioning sailboat mast stays. 4,114,433, Cl. 73-143.000.

Bowler, Jean; and Robinson, Graham Ernest, to Imperial Chemical Industries Limited. 3,4-Epoxy-cyclopenta-1,2-diyl prostanes. 4,115,580, Cl. 424-278.000.

Bozeman, Arlene, executrix: *See—*
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,115,241, Cl. 208-33.000.

Bozeman, Paul P., Jr., deceased: *See—*
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,115,241, Cl. 208-33.000.

Bozzi, Edward G.; and Nelson, Robert C., to Ciba-Geigy Corporation. Process for making stable solvent-free, aqueous epoxy resin dispersions. 4,115,328, Cl. 260-24.000.

Braatz, Willi. Tumbler lock alarm construction. 4,114,412, Cl. 70-441.000.

Brady, Donnie G., to Phillips Petroleum Company. Mold corrosion inhibition in poly(arylene) sulfide processing. 4,115,344, Cl. 260-37.00R.

Brady, Michael Barry; and Lewis, Peter Frederick, to English Electric Valve Company Limited. Multipactor discharge tuned resonant cavity devices. 4,115,746, Cl. 331-90.000.

Braitinger, Helmut: *See—*
Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, 4,114,489, Cl. 83-298.000.

Brandt-Pra, Inc.: *See—*
Di Biasio, John A., 4,114,870, Cl. 271-35.000.
Jones, Alan P.; and Sherman, William, 4,114,804, Cl. 235-476.000.

Braun, Hans; Cieslok, Gunter; and Wolf, Franz, to L. Schuler GmbH. Strip material dividing device. 4,114,490, Cl. 83-303.000.

Braun, Peter: *See—*
Kramer, Klaus; Dietrich, Toni; and Braun, Peter, 4,115,802, Cl. 358-93.000.

Braunschweigische Maschinenbauanstalt: *See—*
Dietzel, Walter; and Athenstedt, Martin, 4,115,145, Cl. 127-5.000.

Brawn, Peter Nelson. Positive reinforcement respiratory inhalation device. 4,114,616, Cl. 128-210.000.

Bremat S.A.: *See—*
Bernstein, Max Jeremie, 4,115,604, Cl. 427-329.000.

Breneman, Inc.: *See—*
Erpenbeck, Paul J., 4,114,266, Cl. 30-123.000.

Bretts, Gerald R.: *See—*
Kavesh, Sheldon; and Bretts, Gerald R., 4,115,682, Cl. 219-118.000.

Brichard, Jean; and Colery, Jean-Claude, to Interox. Manufacturing process for sodium perborate monohydrate and product obtained according to the process. 4,115,519, Cl. 423-279.000.

Brill, William F., to Halcon International, Inc. Catalytic conversion of thallium (I) to thallium (III). 4,115,420, Cl. 260-429.00R.

Brill, William F., to Halcon International, Inc. Process for converting thallium (I) to thallium (III). 4,115,421, Cl. 260-429.00R.

Brindle, Dale L., to Hennessy Products, Incorporated. Plug door operating and moving mechanism. 4,114,318, Cl. 49-215.000.

Brinkmeier, Friedhelm: *See—*
Achelpohl, Fritz; and Brinkmeier, Friedhelm, 4,114,520, Cl. 93-33.00H.

Brisk, Richard A.; and Miller, David E., to Dynamics Research Corporation. Back gauge controller. 4,115,859, Cl. 364-476.000.

Bristol-Myers Company: *See—*
Monkovic, Ivo, 4,115,389, Cl. 260-289.00D.

British Industrial Plastics Ltd.: *See—*
Kendall-Smith, Brian John; and Bonnington, Michael Glynn, 4,115,509, Cl. 264-331.000.

British Petroleum Company Limited, The: *See—*
Crump, Ronald Alfred; and McCain, Colin Christopher, 4,115,130, Cl. 106-15.00R.

Bronoel, Guy: *See—*
Bonnemay, Maurice; Bronoel, Guy; Angely, Lysiane; and Peslerbe, Gilbert, 4,115,628, Cl. 429-44.000.

Brooks, Gerald: *See—*
Bentley, Peter Hubert; and Brooks, Gerald, 4,115,646, Cl. 544-27.000.

Brosh, Amnon; and Geiger, Dana F., to Kulite Semiconductor Products, Inc. Apparatus for converting an analog signal into digital form particularly adapted for use in digital counter displays. 4,115,767, Cl. 340-347.0CC.

Brown, Andrew James. Explosive device. 4,114,537, Cl. 102-24.0HC.

Brown, Arling Dix, Jr.; and Reilly, Edward Justus, to Gould Inc. Electrical switching system. 4,115,763, Cl. 340-166.00R.

Brown, Gary Leigh; Cummings, Weldon Clifford; and Levine, Isaac Jacob, to Union Carbide Corporation. Ethylene polymerization with ether modified catalyst. 4,115,639, Cl. 526-130.000.

Brown, Herbert R., to United States of America, Air Force. Parachute canopy deployment control apparatus. 4,114,840, Cl. 244-152.000.

Brown, Jack Frederick, to James Ross Limited. Creping doctor device. 4,114,228, Cl. 15-256.510.

Brown Oil Tools, Inc.: *See—*
Dinning, Robert W., 4,114,694, Cl. 166-318.000.

Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifugal apparatus with biaxial connector. 4,114,802, Cl. 233-26.000.

Brown, Richard R., to Sperry Rand Corporation. Digital stroke display with vector, circle and character generation capability. 4,115,863, Cl. 364-521.000.

Brown, Vaikai K.; and Fatur, Richard N., to Towmotor Corporation. Brake and creeper control system. 4,114,738, Cl. 192-4.00A.

Brown, William A., to Champion International Corporation. Solicitation envelope carrier. 4,114,799, Cl. 229-72.000.

Browning, Charles E., to United States of America, Air Force. Environmental test chamber system. 4,114,420, Cl. 73-15.600.

Brownlee, Theodore. Radiation powered illuminated display. 4,114,299, Cl. 40-545.000.

Brubaker, Gaylen R.: *See—*
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,115,060, Cl. 8-111.000.

Brueckner, Hubert U.: *See—*
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,114,983, Cl. 350-164.000.

Brunet, Maurice: *See—*
Habermann, Helmut; Brunet, Maurice; and LeClere, Jacques, 4,114,960, Cl. 308-10.000.

Brunsch, Klaus: *See—*
Konig, Rudolf; and Brunsch, Klaus, 4,114,962, Cl. 308-238.000.

Brunsting, Albert, to Coulter Electronics, Inc. Cuvette configured for photoanalysis use. 4,115,011, Cl. 356-246.000.

Brunswick Corporation: *See—*
Sleder, Richard L.; and Schmiedel, Robert C., 4,114,583, Cl. 123-148.0CC.
Storms, Ronald L., 4,114,794, Cl. 228-182.000.

Bruun, Lars Ojvind, to Volvo BM AB. Method of forest harvesting and a machine for performing said method. 4,114,666, Cl. 144-309.0AC.

Brynemo, Jan Jorgen; and Spilhaug, Tor William, to A/S Kjaettingfabriken. Safety hook. 4,114,940, Cl. 294-82.00R.

Buccella, Osvaldo: *See—*
Ubaldi, Luciano; and Buccella, Osvaldo, 4,114,562, Cl. 118-50.000.

Buchanan, Ritchie. Mop having a removable cover. 4,114,223, Cl. 15-228.000.

Buchholz, Alexis Emmanuel, to Gillette Company, The. Clipper mechanism. 4,114,264, Cl. 30-34.100.

Buchsteiner, Josef: *See—*
Malata, Peter; and Buchsteiner, Josef, 4,114,276, Cl. 32-26.000.

Buckbee-Mears Company: *See—*
Hertel, Roger C., 4,115,752, Cl. 340-3.00C.

Buckeye Cellulose Corporation, The: *See—*
Smith, Linda Hebert; and Johnson, Robert C., 4,114,200, Cl. 2-51.000.

Buckley, Raymond. Screens suitable for use in photo-engraving and photo-lithographic processes and in color television. 4,114,982, Cl. 350-127.000.

Buckner, Ian Wilfrid, to Plessey Handel und Investments AG. Frequency-comparing devices. 4,115,728, Cl. 318-318.000.

Budke, Robert L.; and Freeborn, Lowell C. Noise-controlled circular saw blade. 4,114,494, Cl. 83-835.000.

Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., to General Electric Company. Mounting device. 4,115,674, Cl. 200-329.000.

Buechner, Oskar: *See—*
Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, 4,115,638, Cl. 526-61.000.

Buhrer, Erwin. Method and apparatus for pouring a mold with a selectable amount of casting material. 4,114,675, Cl. 164-4.000.

Buhrer, Erwin. Mold forming apparatus with mold flask bracer means. 4,114,678, Cl. 164-207.000.

Bukowick, Peter Anthony, to Hercules Incorporated. Certain oximinyl allophanates and their use as herbicides. 4,115,093, Cl. 71-88.000.

Bull, Dale L.; and Rautiola, Norman A., to Nartron Corporation. Lamp assembly. 4,115,844, Cl. 362-382.000.

Bullard, Wade A. Method of reprinting on a print removable paper product. 4,115,602, Cl. 427-140.000.

Bulson, Walter T.; Christie, Peter A.; and Jones, James R., to Armstrong Cork Company. Process for producing metal halide-amide reaction product. 4,115,423, Cl. 260-429.500.

Bultmann, Friedrich, to Daimler-Benz Aktiengesellschaft. Retarder for vehicles, especially heavy trucks. 4,114,734, Cl. 188-274.000.

Bun, Isaak Mozesovich: *See—*
Nudelman, Boris Izrailovich; Sventsitsky, Alexandr Sergeevich; Bikbau, Marsel Yanovich; Bun, Isaak Mozesovich; and Kevvai, Arnold Arnoldovich, 4,115,138, Cl. 106-100.000.

Buonadonna, Victor R.; Richardson, Ralph J.; Rasmussen, Richard L.; and Jeffers, William Q., to McDonnell Douglas Corporation. Carbon monosulfide generating process. 4,115,168, Cl. 149-109.600.

Burke, Oliver W., Jr., to Exxon Research and Engineering Company. Emulsifying and separating latex and solvent. 4,115,316, Cl. 252-359.00A.

Burley, John Charles. Method and apparatus for cutting cloth. 4,115,681, Cl. 219-10.570.

Burnham, Geoffrey Desmond: *See—*
Laird, Richard Alan; and Burnham, Geoffrey Desmond, 4,114,911, Cl. 280-11.37F.

Burns, Howard Mathew. Holder device. 4,114,925, Cl. 281-45.000.

Burroughs Corporation: *See—*
Bluhm, Vernon A., 4,115,872, Cl. 365-163.000.
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,115,836, Cl. 361-382.000.

Burt, Harold S., to Conco Inc. Vacuum pickup head. 4,114,939, Cl. 294-64.00R.

Burton, John David: *See—*
Selwood, Peter Richard, deceased; Selwood, Timothy John, executor; Axtell, Martin John Shelley, executor; and Burton, John David, 4,115,041, Cl. 417-440.000.

Burton, Ralph Ashby, to Northwestern University. Ignition enhancement chamber for internal combustion engine. 4,114,567, Cl. 123-30.00A.

Burwell, Clifton J.: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,114,647, Cl. 137-624.200.

Busch, Theodore N., to Caswell Equipment Co. Ventilation method and system for protecting shooters from pollutants. 4,114,521, Cl. 98-36.000.

Bushey, William Raymond, to Du Pont de Nemours, E. I., and Company. Process for treating zircon-containing foundry sand. 4,115,345, Cl. 260-38.000.

Butcher, Norman P. Tube coupling for vacuum cleaners. 4,114,927, Cl. 285-7.000.

Butler, Stanley Milton, to Direct Power Limited. Opposed piston internal combustion engine-driven pump. 4,115,037, Cl. 417-341.000.

Butti, James Paul, to Babcock & Wilcox Company, The. Reactor pressure vessel support. 4,115,194, Cl. 176-87.000.

Butts, William O.: *See—*
Putnam, Hubert P.; and Butts, William O., 4,115,869, Cl. 364-900.000.

Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Scherbakov, Vsevolod Sergeevich; and Gruzintsev, Igor Andreevich. Suction valve of the piston compressor. 4,115,043, Cl. 417-559.000.

Byrne, James C.; and Talmage, Dennis D., to Gulf & Western Manufacturing Company. Control circuit for vehicle compartment light. 4,115,723, Cl. 315-84.000.

C. van der Lely N.V.: *See—*
Gijsbers, Roelof, 4,114,815, Cl. 241-45.000.
van der Lely, Ary, 4,114,695, Cl. 172-47.000.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,114,696, Cl. 172-59.000.

Cale, Albert D., Jr.: *See—*
Lunsford, Carl D.; and Cale, Albert D., Jr., 4,115,587, Cl. 424-324.000.

Cali, Frank J. Retractable breaker switch toggle handle. 4,115,669, Cl. 200-331.000.

Cambron, Robert B.: *See—*
Glover, Glen A., Jr.; and Cambron, Robert B., 4,114,518, Cl. 92-208.000.

Camillo, Edward: *See—*
Humphreys, Wesley G.; and Camillo, Edward, 4,114,805, Cl. 236-1.00G.

Campana, Patsie Carmen. Thermal torch and method. 4,114,863, Cl. 266-48.000.

Campbell, Charles M.: *See—*
Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., 4,114,789, Cl. 224-42.10E.

Canadian Foremost Ltd.: *See—*
Saruwatari, Minoru, 4,114,375, Cl. 60-372.000.

Canadian Patents & Development Limited: *See—*
Wallace, Rebecca; Ashton, Fraser E.; Perry, Malcolm B.; and Diena, Benito B., 4,115,543, Cl. 424-8.000.

Cancilleri, Ezio, to Cean S.p.A. Process for manufacturing enamels of polyester-polyimide resins, particularly for coating electric conductors. 4,115,337, Cl. 260-29.20N.

Capone, David M., to Thermo-Lab Instruments, Inc. Apparatus for sampling a gaseous stream. 4,115,229, Cl. 204-195.00S.

Capone, David M., to Thermo-Lab Instruments, Inc. Apparatus for conveying a gas sample through an analyzer chamber. 4,115,235, Cl. 204-195.00S.

Capowski, Robert S.; Wright, Lewis W.; and Zimmerman, Terrence K., to International Business Machines Corporation. Channel bus controller. 4,115,854, Cl. 364-200.000.

Carborundum Company, The: *See—*
Holt, William H., 4,115,271, Cl. 210-247.000.

Carey, John Laurence: *See—*
Greenhalgh, Colin William; Carey, John Laurence; and Newton, David Francis, 4,115,404, Cl. 260-343.30R.

Carl Freudenberg, Firma: *See—*
Disko, Eberhard, 4,114,224, Cl. 15-229.00A.

Carl Manufacturing Co., Ltd.: *See—*
Mori, Chuzo, 4,114,301, Cl. 40-389.000.

Carl Still, Firma: *See—*
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, 4,115,202, Cl. 202-99.000.

Carlin, Jack M. Rupturable flow retarding disk for fire hoses. 4,114,653, Cl. 138-45.000.

Carlizza, Jean: *See—*
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,115,113, Cl. 75-206.000.

Carlo Erba S.p.A.: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.

Carlson, Carl S.; Kinsella, Lawrence M.; and Pixley, Daniel L., to Diceon Electronics, Inc. Method of thermally dimensionally stabilizing a printed circuit board. 4,115,185, Cl. 156-634.000.

Carlson, Glenn R., to Rohm and Haas Company. 1-Aryl-4-pyridones. 4,115,101, Cl. 71-94.000.

Carlucci, James J. Finger wheel. 4,114,697, Cl. 172-543.000.

Carmack, Gary: *See—*
Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., 4,115,209, Cl. 204-1.00T.

Carolan, Raymond Jerome, to Boeing Company, The. Water closet tank drain valve. 4,114,203, Cl. 4-317.000.

Carpentier, Theodore, to Universal Power Corporation. Drive means for electric generators particularly adapted in floating power plant. 4,114,468, Cl. 74-410.000.

Carpio, Ronald A.: *See—*
Nardi, John C.; Hussey, Charles L.; King, Lowell A.; and Carpio, Ronald A., 4,115,390, Cl. 260-290.0HL.

Carroll, Frank E., to Carroll Research, Inc. Sheet metal structural shape and use in building structures. 4,114,335, Cl. 52-336.000.

Carroll, John C.; and Carroll, John M. Roll conveyor for a machine tool. 4,114,749, Cl. 193-35.00C.

Carroll, John M.: *See—*
Carroll, John C.; and Carroll, John M., 4,114,749, Cl. 193-35.00C.

Carroll Research, Inc.: *See—*
Carroll, Frank E., 4,114,335, Cl. 52-336.000.

Carter, Sidney T., to A-T-O Inc. Wrap neck label mechanism. 4,115,179, Cl. 156-444.000.

Cartier, George E., to Monsanto Company. Abrasion resistant coating compositions. 4,115,622, Cl. 428-409.000.

Cash, George V.: *See—*
Smashey, Russell W.; Frey, Elmer L.; Cash, George V.; and Irons, George S., 4,115,112, Cl. 75-171.000.

Caswell Equipment Co.: *See—*
Busch, Theodore N., 4,114,521, Cl. 98-36.000.

Catanese, Carmen Anthony; Harrison, James Berkeley, Jr.; and Lindburg, Norman Lee, to RCA Corporation. Electron multiplier with high energy electron filter. 4,115,719, Cl. 313-105.00R.

Caterpillar Tractor Co.: *See—*
Boggs, Roger L., 4,114,958, Cl. 305-56.000.
Davis, Warren W.; and Keedy, David E., 4,114,368, Cl. 60-39.16R.
Glover, Glen A., Jr.; and Cambron, Robert B., 4,114,518, Cl. 92-208.000.
Johnson, Howard L., 4,114,516, Cl. 91-420.000.
Sanders, Julian V., 4,114,716, Cl. 180-68.00R.

Cattaneo, Maurizio; and Bertone, Antonino, to FIAT Societa per Azioni. Servo-assisted hydraulic braking system. 4,114,376, Cl. 60-548.000.

Cattrall, Robert W.: *See—*
Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., 4,115,209, Cl. 204-1.00T.

Cean S.p.A.: *See—*
Cancilleri, Ezio, 4,115,337, Cl. 260-29.20N.

Ceballos, Arthur: *See—*
Beal, Steven G.; Ceballos, Arthur; and Ceballos, Dolores D., 4,114,762, Cl. 209-78.000.

Ceballos, Dolores D.: *See—*
Beal, Steven G.; Ceballos, Arthur; and Ceballos, Dolores D., 4,114,762, Cl. 209-78.000.

Cecka, Andrew M., to Fansteel, Inc. Tennis racket assembly. 4,114,880, Cl. 273-73.00G.

Celanese Corporation: *See—*
Slinkard, William E., 4,115,442, Cl. 562-548.000.

Cenci, Harry J.; and Swift, Graham, to Rohm and Haas Company. Method for curing polymers containing hydroxyalkylamide groups by means of nonpolymeric polycarboxylic acids, and compositions. 4,115,637, Cl. 526-56.000.

Centro-Maskin Goteborg AB: *See—*
Johansson, Bengt, 4,115,151, Cl. 148-9.500.
Johansson, Bengt, 4,115,152, Cl. 148-9.500.
Johansson, Bengt, 4,115,153, Cl. 148-9.500.

Ceperley, Peter Hutson. Traveling wave heat engine. 4,114,380, Cl. 60-721.000.

Ceraver S.A.: *See—*
Willem, Michel, 4,114,676, Cl. 164-108.000.

CGR Ultrasonic: *See*—
Dory, Jacques, 4,114,456, Cl. 73-622.000.

Chadha, Naresh Kumar; Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Assymmetric synthesis of optically active prostaglandins. 4,115,452, Cl. 260-586.00R.

Chadwick, David H., to Mobay Chemical Corporation. Hydroxyl containing materials from distillation residue obtained by distilling hexamethylene diamine from a mixture thereof with by-products obtained in the hydrogenation of adiponitrile to produce hexamethylene diamine. 4,115,304, Cl. 521-167.000.

Chakirof, Dimitri A., to Upjohn Company, The. Stabilized polyol compositions and polyurethane foams. 4,115,300, Cl. 521-171.000.

Chakrabarti, Jiban Kumar; and Tupper, David Edward, to Lilly Industries Limited. Thieno[3,2-b]-[1,5]benzodiazepines. 4,115,568, Cl. 424-250.000.

Chakrabarti, Jiban Kumar; and Tupper, David Edward, to Lilly Industries Limited. Benzodiazepine derivatives. 4,115,574, Cl. 424-250.000.

Chakravarti, Kalidas: *See*—
Lazarus, Stanley David; and Chakravarti, Kalidas, 4,115,350, Cl. 260-45.80A.

Chalker, Betty B. Method of fitting a garment. 4,114,277, Cl. 33-14.000.

Chambers, Hubert Harold; and Tear, Brian John, to Laporte Industries Limited. Method of preparing metal oxide slurries. 4,115,144, Cl. 106-300.000.

Chambers, Virginia Edith May: *See*—
Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,115,065, Cl. 23-230.600.

Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Pile fabric. 4,114,549, Cl. 112-410.000.

Champion International Corporation: *See*—
Brown, William A., 4,114,799, Cl. 229-72.000.
Chambley, Phillip W.; and Norris, Alan H., 4,114,549, Cl. 112-410.000.
Mulroy, Terence J., 4,114,795, Cl. 229-23.00R.
Sieffert, William G., 4,114,757, Cl. 206-424.000.
Vassiliades, Anthony E.; Vincent, David N.; and Shroff, Shrenik, 4,115,474, Cl. 260-855.000.

Chandler, Roy L., to Geno Corporation. Electrical switch assembly. 4,115,670, Cl. 200-5.00R.

Chang, Wei-Yi; and Cheng, Chen-Yen. Method and apparatus for tracking the sun for use in a solar collector with linear focusing means. 4,114,596, Cl. 126-270.000.

Chapin, Leo N.: *See*—
Bach, Frederick O.; Chapin, Leo N.; and Freed, Robert, 4,115,289, Cl. 252-62.10P.

Charbonnages de France: *See*—
Valantin, Alfred Alphonse Marie, 4,114,385, Cl. 405-298.000.

Charles, Marvin: *See*—
Coughlin, Robert W.; Charles, Marvin; and Allen, Billy R., 4,115,198, Cl. 195-63.000.

Chas. Olson & Sons: *See*—
Nelson, Eldrid W., 4,114,947, Cl. 297-344.000.

Chas. S. Tanner Co.: *See*—
Lindemann, Martin K., 4,115,306, Cl. 260-17.00A.

Chemed Corporation: *See*—
Every, Richard L.; and Jacob, Jose T., 4,115,139, Cl. 106-100.000.

Chemetron Corporation: *See*—
Moore, Donald G., 4,115,679, Cl. 219-10.55M.
Moore, Donald G., 4,115,680, Cl. 219-10.55B.

Chemische Werke Huls AG: *See*—
Coenen, Alfred; Kosswig, Kurt; and Prominski, Gunter, 4,115,530, Cl. 423-488.000.
Kalka, Josef, 4,115,640, Cl. 528-483.000.
Muller, Wolfgang, 4,115,460, Cl. 260-648.00R.

Cheng, Chen-Yen: *See*—
Chang, Wei-Yi; and Cheng, Chen-Yen, 4,114,596, Cl. 126-270.000.

Chepkalenko, Mikhail Gavrilovich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Chernikin, Alexei Vadimovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Chesebrough-Pond's Inc.: *See*—
Russo, Ronald D., 4,114,607, Cl. 128-2.080.
Russo, Ronald D., 4,114,608, Cl. 128-2.080.

Chevron Research Company: *See*—
Anshus, Byron E., 4,115,399, Cl. 260-326.5FN.
Blanton, William A., Jr.; and Flanders, Robert L., 4,115,249, Cl. 208-120.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,115,250, Cl. 208-120.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,115,251, Cl. 208-120.000.
Jennings, Harley Y., Jr., 4,114,956, Cl. 302-66.000.
Mulaskey, Bernard F., 4,115,248, Cl. 208-112.000.
Nielsen, William C., 4,115,072, Cl. 422-207.000.

Chiba, Jiro: *See*—
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.

Chiba, Takashi, to Fujitsu Limited. Buffer memory control device having priority control units for priority processing set blocks and unit blocks in a buffer memory. 4,115,855, Cl. 364-200.000.

Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having an electronic filter with time variant slope. 4,114,498, Cl. 84-1.190.

Chicago Bridge & Iron Company: *See*—
Orndorff, James A., Jr.; Wozniak, Robert S.; and Andrepont, John S., 4,114,556, Cl. 114-230.000.

Chicago Pneumatic Tool Company: *See*—
Bouplon, Edward J., 4,114,701, Cl. 175-84.000.

Chino, Nobuo: *See*—
Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, 4,114,282, Cl. 33-180.00R.

Choay S.A.: *See*—
Lormeau, Jean-Claude; Goulay, Jean; and Vairel, Edmond, 4,115,551, Cl. 424-105.000.

Chou, Ta Sen; and Zintgraff, Gary D., to Eli Lilly and Company. Process for preparing pure cefamandole from alkali metal and ammonium salts thereof. 4,115,644, Cl. 544-20.000.

Chow, Thomas, to Arco Industries Ltd. Toy guns. 4,114,311, Cl. 46-192.000.

Chr. Hansen's Laboratory, Inc.: *See*—
Porubcan, Randolph S.; and Sellars, Robert L., 4,115,199, Cl. 195-96.000.

Christ, Alfred, to Escher Wyss Limited. Hydrostatic supporting device including bearing shoe. 4,114,959, Cl. 308-3.500.

Christie, Peter A.: *See*—
Bulson, Walter T.; Christie, Peter A.; and Jones, James R., 4,115,423, Cl. 260-429.500.

Christner, Larry G.; Nagle, Dennis C.; and Watson, Paul R., to United Technologies Corporation. Method for fabricating a carbon electrode substrate. 4,115,528, Cl. 423-449.000.

Christner, Larry G.; and Nagle, Dennis C., to United Technologies Corporation. Electrochemical cell comprising a ribbed electrode substrate. 4,115,627, Cl. 429-44.000.

Chrysler Corporation: *See*—
Platzer, George E., Jr., 4,114,574, Cl. 123-117.00R.

Chu, Cheng-Hsien: *See*—
Stark, William H.; and Chu, Cheng-Hsien, 4,115,517, Cl. 423-243.000.

Chung, Alfred: *See*—
Ryan, James Walter; and Chung, Alfred, 4,115,374, Cl. 260-112.50R.

Ciba-Geigy AG: *See*—
Aeschlimann, Peter, 4,115,053, Cl. 8-2.50A.
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,115,121, Cl. 96-56.300.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,115,056, Cl. 8-39.00B.
Rossi, Alberto; and Egli, Christian, 4,115,416, Cl. 260-413.000.

Ciba-Geigy Corporation: *See*—
Andrews, Christopher Michael, 4,115,296, Cl. 528-92.000.
Boger, Manfred; and Kristiansen, Odd, 4,115,561, Cl. 424-211.000.
Boger, Manfred; and Drabek, Jozef, 4,115,583, Cl. 424-300.000.
Bozzi, Edward G.; and Nelson, Robert C., 4,115,328, Cl. 260-24.000.
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,115,231, Cl. 204-159.220.
Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, 4,115,359, Cl. 528-170.000.
Fearnley, Charles; Fordham, Glenda Helen; and Lee, Frank, 4,115,294, Cl. 252-106.000.
Frei, Jorg; Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,115,575, Cl. 424-250.000.
Garner, Robert; and Petitpierre, Jean Claude, 4,115,450, Cl. 260-558.00A.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,115,566, Cl. 424-246.000.
Loeffler, Herbert H., 4,114,811, Cl. 239-288.500.
Ramanathan, Visvanathan, 4,115,381, Cl. 260-207.100.
Rohr, Otto, 4,115,430, Cl. 260-465.00D.
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,115,368, Cl. 528-229.000.
Schurter, Rolf; Rempfler, Hermann; and Fory, Werner, 4,115,100, Cl. 71-94.000.

Cieslok, Gunter: *See*—
Braun, Hans; Cieslok, Gunter; and Wolf, Franz, 4,114,490, Cl. 83-303.000.

Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to BASF Wyandotte Corporation; BASF Wyandotte Corporation; and BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials, method of preparing the same, and stock solutions prepared therefrom. 4,115,281, Cl. 252-8.800.

Cime Bocuze: *See*—
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,115,113, Cl. 75-206.000.

Cines, Martin R., to Phillips Petroleum Company. Production of carbon monoxide. 4,115,524, Cl. 423-415.00A.
Cipris, Divna, to Allied Chemical Corporation. Selenium- and tellurium-coated metal electrodes. 4,115,238, Cl. 204-290.00R.
Cirkel, Hans-Jurgen, to Kraftwerk Union Aktiengesellschaft. Power capacitor. 4,115,833, Cl. 361-303.000.
Clarion Company Limited: *See—*
Takagi, Satoshi; Watanabe, Wataru; and Yokota, Tadashi, 4,115,826, Cl. 360-96.000.
Clark, Albert L., to Pac-Craft Products, Inc. Scissors lift work platform. 4,114,854, Cl. 254-122.000.
Clark Equipment Company: *See—*
Doolittle, Mac R., 4,114,724, Cl. 180-155.000.
Clark, Fred E., Jr.: *See—*
Skrovanek, Ambroz K.; and Clark, Fred E., Jr., 4,115,668, Cl. 179-170.200.
Clark, John Campbell, to Coal Industry (Patents) Limited. Method of and apparatus for sensing strain in strained members. 4,114,429, Cl. 73-88.50R.
Clark, Kendall; and Shapiro, Milton R., to International Business Machines Corporation. Laser piercing of materials by induced shock waves. 4,115,683, Cl. 219-121.00L.
Clark, Leonard R.; and Meehl, David W., to Standard Pressed Steel Co. Method of assembling storage system. 4,114,249, Cl. 29-513.000.
Clark, Michael J.; and Rohrmoser, Howard L., to Dow Chemical Company, The. Separation process. 4,115,080, Cl. 55-54.000.
Clark, Thomas D. Method and apparatus for photographic recordation of multiple images. 4,115,002, Cl. 355-54.000.
Clark, Trevor Percival. Freeze thaw indicator. 4,114,443, Cl. 73-358.000.
Clarke-Gravely Corporation: *See—*
Jones, Terry H.; and Oakes, John J., 4,114,229, Cl. 15-320.000.
Clarke, John F., to United States of America, Energy. High beta plasma operation in a toroidal plasma producing device. 4,115,190, Cl. 176-3.000.
Clauss, Julius Alphonse, to Borg-Warner Corporation. Planetary transmission mechanism. 4,114,478, Cl. 74-781.00R.
Cleary, James G.: *See—*
Kulkarni, Avinash D.; and Cleary, James G., 4,115,513, Cl. 423-56.000.
Clifton, Kenneth C.: *See—*
Gladow, Dean E.; and Clifton, Kenneth C., 4,114,869, Cl. 270-37.000.
Close, Ralph E.; and Oroshnik, William, to SCM Corporation. Synthesis of acetylenic compounds useful in preparing dehydrophytols and Vitamin E. 4,115,466, Cl. 260-678.000.
Closson, Addison W., Jr. Laminated thermoplastic counter stiffener. 4,115,612, Cl. 428-172.000.
Clouser, Paul Lee: *See—*
Cole, Sidney Michael; and Clouser, Paul Lee, 4,115,749, Cl. 333-31.00R.
Coal Industry (Patents) Limited: *See—*
Clark, John Campbell, 4,114,429, Cl. 73-88.50R.
Coats Company, Inc., The: *See—*
Holladay, Jimmie L.; and Scott, Ray A., 4,114,672, Cl. 157-1.240.
Coats, Ronald Galen. Distribution rectifier for inlet manifold systems. 4,114,580, Cl. 123-141.000.
Coblitz, Sanford E.; and Bjalme, Bengt G., to Wheeler Manufacturing Corporation. Pipe cutter and beveler. 4,114,485, Cl. 82-4.00C.
Cochran, C. Norman: *See—*
Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., 4,115,215, Cl. 204-67.000.
Coenen, Alfred; Kosswig, Kurt; and Prominski, Gunter, to Chemische Werke Huls AG. Process for obtaining gaseous hydrogen chloride from dilute, aqueous hydrochloric acid. 4,115,530, Cl. 423-488.000.
Coggins, Robert Wayne, to Combustion Engineering, Inc. Combined separator vessel and gas absorber vessel. 4,115,084, Cl. 55-176.000.
Cohen, Merrill. Growing plants in an aquarium. 4,114,316, Cl. 47-64.000.
Cohen, Teddy. Foldable multi-purpose cart. 4,114,914, Cl. 280-30.000.
Colclough, Terence; and Swinney, Brian, to Exxon Research and Engineering Company. Lubricating compositions. 4,115,287, Cl. 252-48.200.
Cole, Sidney Michael; and Clouser, Paul Lee, to United States of America, Air Force. Microwave hybrid phase matching spacer. 4,115,749, Cl. 333-31.00R.
Coleman, Eugene W., to Picker Corporation. Package and method of making. 4,114,758, Cl. 206-471.000.
Colery, Jean-Claude: *See—*
Brichard, Jean; and Colery, Jean-Claude, 4,115,519, Cl. 423-279.000.
Coles, Albert Edward: *See—*
Cross, Michael Ellison; and Coles, Albert Edward, 4,114,639, Cl. 137-246.220.
Colgate Palmolive Company: *See—*
Vidra, James David; and Nachtigal, Julius Harvey, 4,115,546, Cl. 424-50.000.
Colle, Pierre: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.
Colleoni, Gianfranco: *See—*
Sighieri, Pierluigi; and Colleoni, Gianfranco, 4,114,790, Cl. 226-91.000.
Collette, Ronald J.: *See—*
MacAfee, Jerry D.; and Collette, Ronald J., 4,114,856, Cl. 251-306.000.
Colombier, Gabriel: *See—*
Patrie, Jos; and Colombier, Gabriel, 4,115,212, Cl. 204-38.00E.
Colonna, Jerome; Monville, Jean-Michel; and Munoz, Francois, to SKF Compagnie d'Applications Mecaniques. Spring for free-wheeling device. 4,114,739, Cl. 192-41.00A.
Colpitts, Ralph W., to Polythetics, Inc. Dentures and process for making the same. 4,115,488, Cl. 264-17.000.
Combustion Engineering, Inc.: *See—*
Coggins, Robert Wayne, 4,115,084, Cl. 55-176.000.
Groves, Malcolm Duane, 4,115,700, Cl. 250-518.000.
Combustion Equipment Associates Inc.: *See—*
Lyshkow, Norman A., 4,115,067, Cl. 422-56.000.
Commander, Robert Duncan; Gardner, Peter Alan Edward; and Taylor, John Richard, to International Business Machines Corporation. Track following servosystem for data storage apparatus. 4,115,823, Cl. 360-77.000.
Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,114,907, Cl. 277-206.00R.
Jogand, Patrick, 4,115,192, Cl. 176-40.000.
Marchand, Joseph; and Puig, Jean-Rene, 4,115,303, Cl. 521-53.000.
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Bolto, Brian Alfred; and Eppinger, Kurt Hermann, 4,115,297, Cl. 521-32.000.
Communications Satellite Corporation: *See—*
Van Ommering, Gerrit; Stockel, Joseph F.; and Dunlop, James D., 4,115,630, Cl. 429-72.000.
Compagnie des Terminaux Marins Coterm: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines: *See—*
Lamy, Jacques Edouard, 4,114,392, Cl. 405-207.000.
Compagnie Internationale de Minerallurgie-CIM: *See—*
Dewitte, Jean; and Letourneur, Pierre, 4,115,504, Cl. 264-221.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See—*
Lesieur, Jean-Paul, 4,115,818, Cl. 360-5.000.
Compagnie Internationale pour l'Informatique Cil Honeywell Bull: *See—*
Labeye-Voisin, Gerard Francois; and Hostein, Claude, 4,115,856, Cl. 364-200.000.
Compagnie Royale Asturienne des Mines: *See—*
Dekeister, Roger; Lemaire, Gilbert; and Marzys, Daniel, 4,115,210, Cl. 204-10.000.
Comperatore, John A., to PPG Industries, Inc. Shaping glass sheets by gravity sagging on solid molds. 4,115,090, Cl. 65-25.00A.
Compton, Thomas A.: *See—*
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,114,563, Cl. 118-63.000.
Conco Inc.: *See—*
Burt, Harold S., 4,114,939, Cl. 294-64.00R.
Condon, David C.: *See—*
Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., 4,114,750, Cl. 400-279.000.
Cone, Charles N.; and Steinberg, Julius M., to Pacific Adhesives, Inc. Method of making glued, laminated assemblies in prepressed and final pressed stages. 4,115,178, Cl. 156-291.000.
Conservation Controls Corp.: *See—*
Naseck, Melvin L.; and Hickman, Mark R., 4,114,807, Cl. 236-1.00E.
Consolidated Packaging, Inc.: *See—*
Voges, Fred Paul, 4,114,796, Cl. 229-27.000.
Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,114,798, Cl. 229-43.000.
Continental Oil Company: *See—*
Fertl, Walter H.; and Gant, Preston L., 4,115,688, Cl. 250-253.000.
Maxson, Orwin G.; and Achenbach, Gary D., 4,115,606, Cl. 427-386.000.
Sweany, Glenn A., 4,115,246, Cl. 208-56.000.
Cooper, George Anthony, to Institut Cerac SA. Method and apparatus for breaking a hard compact material such as rock or concrete. 4,114,950, Cl. 299-15.000.
Cooper, James B. Arithmetic dice game. 4,114,290, Cl. 35-31.00R.
Cooper Laboratories, Inc.: *See—*
Diamond, Julius, 4,115,447, Cl. 260-553.00R.
Diamond, Julius, 4,115,448, Cl. 260-553.00A.
Cooper, Robin D. G., to Eli Lilly and Company. Alkoxycarbonylethylthio-azetidinones and process for their preparation. 4,115,383, Cl. 260-239.00A.
Cornelius, Richard T.: *See—*
Austin, Forrest L.; and Cornelius, Richard T., 4,114,812, Cl. 239-492.000.
Cornell-Dubilier Electric Corp.: *See—*
Robinson, William M.; and Lobo, Edward, 4,115,834, Cl. 361-318.000.

Corno, Maria Luisa: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.

Corrado, Giovanni, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Unsaturated polyesteramides, method for their production and hardenable resins produced from the said polyesteramides. 4,115,370, Cl. 260-22.0CQ.

Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, to Bayer Aktiengesellschaft. Process for treating drinking water and sewage. 4,115,261, Cl. 210-40.000.

Cosby, Lowell Alan; Fiato, Rocco Anthony; and Vidal, Jose Luis, to Union Carbide Corporation. Catalyst and process for producing polyhydric alcohols and derivatives. 4,115,433, Cl. 260-449.00L.

Coster, Charles S. Module for forming articles of furniture. 4,114,964, Cl. 312-198.000.

Cotton, Lawrence M., to Stanley Works, The. Apparatus for routing designs in panels. 4,114,664, Cl. 144-134.00D.

Cotton, Lou S., to United Technologies Corporation. Aerodynamic surface load sensing. 4,115,755, Cl. 340-27.00R.

Coughlin, Robert W.; Charles, Marvin; and Allen, Billy R. Method of immobilization of biologically active organic substances including enzymes. 4,115,198, Cl. 195-63.000.

Coulon, Jean-Claude: *See—*
Bourggraff, Robert; and Coulon, Jean-Claude, 4,115,091, Cl. 65-99.00A.

Coulter Electronics, Inc.: *See—*
Brunsting, Albert, 4,115,011, Cl. 356-246.000.

Council, Clifton T.: *See—*
Craig, Robert J. C.; and Council, Clifton T., 4,114,402, Cl. 64-15.00B.

Cowman, Charles D., Jr.; and Shepherd, John P. G., to Minnesota Mining and Manufacturing Company. Method of developing an anticlastic concentrator. 4,115,486, Cl. 264-1.000.

Crabb, Jerry A.: *See—*
Johnson, Winston O.; and Crabb, Jerry A., 4,114,279, Cl. 33-178.00R.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dichloro-4-[(substituted-sulfonyl)-phenoxy]-acetic acids. 4,115,402, Cl. 260-332.20A.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. N-pyrazinecarbonyl-N'-substituted-sulfamoylguanidine and processes for preparing same. 4,115,573, Cl. 424-250.000.

Craig, Robert J. C.; and Council, Clifton T., to Litton Systems, Inc. Flexure hinge assembly. 4,114,402, Cl. 64-15.00B.

Crain, Phillip J.; and Redford, David A., to Texaco Exploration Canada Ltd. Low-temperature oxidation method for the recovery of heavy oils and bitumen. 4,114,690, Cl. 166-261.000.

Cramer, John J.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,115,281, Cl. 252-8.800.

Crawford, Irvin H.: *See—*
Etter, Doyle O.; and Crawford, Irvin H., 4,115,125, Cl. 96-83.000.

Crawley, Richard K. Window and door construction. 4,114,317, Cl. 49-209.000.

Creach, Wally E., to La Barge, Inc. Temperature indicating apparatus. 4,114,447, Cl. 73-362.0AR.

Creus, Rufino, to Spurmach Espana S. L. Driven spinning ring device for yarn machines. 4,114,359, Cl. 57-124.000.

Crippen, Richard E.: *See—*
Hingarh, Hemraj K.; and Crippen, Richard E., 4,115,797, Cl. 357-46.000.

Crittenden, Jack H.; and Bitson, Joseph W., to General Dynamics Corporation. Moving coil miniature angular rate sensor. 4,114,451, Cl. 73-504.000.

Croasdale, William H., to American Can Company. Shield and acoustical assembly. 4,114,725, Cl. 181-205.000.

Croisier, Alain; and Jacquart, Christian, to International Business Machines Corporation. Telephone line interfacing circuit with directional transfer of ringing current and off-hook indications. 4,115,660, Cl. 179-2.50R.

Cross Manufacturing Company (1938) Ltd.: *See—*
Cross, Michael Ellison; and Coles, Albert Edward, 4,114,639, Cl. 137-246.220.

Cross, Michael Ellison; and Coles, Albert Edward, to Cross Manufacturing Company (1938) Ltd. Lubricated rotary valve with concentric sealing rings. 4,114,639, Cl. 137-246.220.

Crossland, William A.: *See—*
Mash, Derek H.; Crossland, William A.; and Morrissy, Joseph H., 4,114,990, Cl. 350-337.000.

Crouzet: *See—*
Muraz, Jean-Max; Payre, Michel; and Rampin, Pierre, 4,114,438, Cl. 73-194.00A.

Crouzet, Pierre Albert. Stable aqueous polyester-monomer emulsions. 4,115,336, Cl. 260-29.6NR.

Crowley, Donald P., to United States of America, Navy. Cook-off coating. 4,114,369, Cl. 60-200.00A.

Cruff, Carlton E.; and Harrison, William E., to United Technologies Corporation. Method and apparatus for drying investment casting molds. 4,114,285, Cl. 34-29.000.

Crump, Ronald Alfred; and McCain, Colin Christopher, to British Petroleum Company Limited, The. Biocidal compositions. 4,115,130, Cl. 106-15.00R.

Csoka, Frank S., to Fun Things, Inc. Peg game. 4,114,892, Cl. 273-265.000.

Cummings, Gary Eugene: *See—*
Dean, Charles Wallace; Cummings, Gary Eugene; and Harvey, Gary Lee, 4,114,340, Cl. 52-520.000.

Cummings, Weldon Clifford: *See—*
Brown, Gary Leigh; Cummings, Weldon Clifford; and Levine, Isaac Jacob, 4,115,639, Cl. 526-130.000.

Cuniberti, Mario; and Pinsenschaum, Edwin C., to Owens-Illinois, Inc. Article transfer method. 4,114,769, Cl. 214-152.000.

Cunningham, Franklin E.: *See—*
Bergquist, Dwight H.; Cunningham, Franklin E.; and Eggleston, Robert M., 4,115,592, Cl. 426-32.000.

Cutler-Hammer, Inc.: *See—*
Smith, Franklin E., 4,115,673, Cl. 200-315.000.

Cyrenne, Roland O. Paper machine draw roll. 4,115,189, Cl. 162-305.000.

D.B.A.: *See—*
Debrus, Philippe Maurice Henri, 4,114,513, Cl. 91-19.000.

Dacey, Raymond B.; and Stringer, Frederick David, to W. R. Grace & Co. Winding core for heat shrinkable film material. 4,114,756, Cl. 206-389.000.

Dacor Corporation: *See—*
Bohmrich, Jack L.; Bowden, William A., Jr.; and Pedersen, Vernon G., 4,114,389, Cl. 405-186.000.

daCosta, Harry H.; Foster, Victor W.; and Thornton, Charles G., deceased (by Thornton, Ella J., heir), to Motorola, Inc. Rotor bias means for miniature watch motors or the like. 4,115,713, Cl. 310-49.00R.

Dai Nippon Printing Co., Ltd.: *See—*
Noshiro, Atsumi; and Inoue, Yoshio, 4,115,329, Cl. 260-25.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Itoh, Tetsuro; Takahashi, Tetsuo; Kimura, Atsuyoshi; and Yamano, Seiichi, 4,115,111, Cl. 75-128.00P.

Daidone, Philip, to Vynacron Dental Co. Casting resins by polymerizing liquid monomer in mixture of particulated vinyl halide resins. 4,115,479, Cl. 260-884.000.

Daimler-Benz Aktiengesellschaft: *See—*
Bultmann, Friedrich, 4,114,734, Cl. 188-274.000.
Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, 4,114,472, Cl. 74-574.000.

Dainippon Ink & Chemicals Inc.: *See—*
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.

Damzog, Bodo: *See—*
Berges, Dietrich; Damzog, Bodo; and Saam, Ulrich, 4,114,361, Cl. 57-156.000.

Dana Corporation: *See—*
Phelps, Orville E., 4,114,404, Cl. 64-17.00A.
Sink, William H.; and Mitchener, Russel L., 4,114,743, Cl. 192-91.00R.

Danfoss A/S: *See—*
Fick, Willy Julius, 4,114,439, Cl. 73-194.00A.
Graversen, Niels Peter Grand, 4,114,806, Cl. 236-1.00C.
Knud, Vagn Valbjorn, 4,114,682, Cl. 165-39.000.
Petersen, Poul, 4,114,846, Cl. 248-68.0CB.
Schjelde, Ole Mikel; and Larsen, Ebbe, 4,115,039, Cl. 417-363.000.
Tankred, Hans Jurgen; and Madsen, Per Johan, 4,115,035, Cl. 417-312.000.
Thun, Niels, 4,114,457, Cl. 73-632.000.

D'Angelo, George J.: *See—*
Roy, Henry A.; and D'Angelo, George J., 4,114,202, Cl. 3-1.500.

Danielak, Joseph H. Paper holder. 4,114,824, Cl. 242-55.530.

Danna, Gary F.: *See—*
Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., 4,115,422, Cl. 260-429.300.

Dannenmann, John E., Jr.: *See—*
Johnson, Bill E.; and Dannenmann, John E., Jr., 4,115,849, Cl. 340-147.0CV.

Dansk Signal Industri A/S: *See—*
Franck, Bent, 4,114,262, Cl. 29-628.000.

Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, to Instrumentation Specialties Company. Automobile trunk antenna mount. 4,115,779, Cl. 343-715.000.

Dany, Franz-Josef: *See—*
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,115,522, Cl. 423-322.000.

Darms, Roland; Kvita, Vratislav; and Greber, Gerd, to Ciba-Geigy Corporation. Crosslinkable mixtures of oligomers or polymers and diamines. 4,115,231, Cl. 204-159.220.

Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, to CIBA-Geigy Corporation. Crosslinkable polymers prepared from maleimidyl substituted trimellitic acid compounds. 4,115,359, Cl. 528-170.000.

Darms, Roland: *See—*
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,115,368, Cl. 528-229.000.

Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., to Aluminum Company of America. Aluminum purification. 4,115,215, Cl. 204-67.000.

Dataproducts Corporation: *See—*
Arzoumanian, Aram Sarkis, 4,114,532, Cl. 101-93.480.

Datotek, Inc.: *See—*
Morgan, Barrie O., 4,115,657, Cl. 178-22.000.

Datta, Amitava, to Allegheny Ludlum Industries, Inc. Processing for cube-on-edge oriented silicon steel. 4,115,161, Cl. 148-111.000.

David Brown Tractors Limited: *See—*
Ashfield, Herbert Edward, 4,114,479, Cl. 74-801.000.

Davidson, Richard Robertson, to Welwyn Hall Research Association. Agglomerated fillers used in paper. 4,115,187, Cl. 162-168.00R.

Davies, Robert William; and Applegate, Barry George, to Molins Limited. Apparatus for the production of wrappers. 4,114,355, Cl. 53-389.000.

Davies, Robert William; and Willett, Peter Ernest, to Molins Limited. Blank feeding. 4,114,872, Cl. 271-91.000.

Davis, Gershon Jerry, to Stauffer Chemical Company. Process for preparing mono-alkyl acid phosphates having high mono-content and light color. 4,115,483, Cl. 260-980.000.

Davis, Warren W.; and Keedy, David E., to Caterpillar Tractor Co. Support for concentric turbine blade shroud. 4,114,368, Cl. 60-39.16R.

Davy Powergas Limited: *See—*
Fowler, Ray, 4,115,467, Cl. 260-683.00R.

Davydova, Larisa Mikhailovna: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Dawkins, Terence Brian, to Terrytune Developments Limited. Internal-combustion engines. 4,114,585, Cl. 123-191.00M.

de la Bastie, Joseph: *See—*
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,115,113, Cl. 75-206.000.

De La Moneda, Francisco H., to International Business Machines Corporation. Charge pumping device with integrated regulating capacitor and method for making same. 4,115,794, Cl. 357-23.000.

Dean, Charles Wallace; Cummings, Gary Eugene; and Harvey, Gary Lee, to Dean Steel Buildings, Inc. Self-interlocking standing seam for a building panel. 4,114,340, Cl. 52-520.000.

Dean Steel Buildings, Inc.: *See—*
Dean, Charles Wallace; Cummings, Gary Eugene; and Harvey, Gary Lee, 4,114,340, Cl. 52-520.000.

Deb, Satyendra Kumar, to Optel Corporation; and Grumman Aerospace Corporation. Energy storing photogalvanic cell having dielectric overcoating. 4,115,631, Cl. 429-111.000.

Debourge, Jean-Claude: *See—*
Lacroix, Guy; Debourge, Jean-Claude; and Ducret, Jacques, 4,115,559, Cl. 424-209.000.

De Brey, Robert J. Particle monitoring system. 4,114,557, Cl. 116-67.00R.

Debrus, Philippe Maurice Henri, to D.B.A. Step-by-step controlled servomechanism. 4,114,513, Cl. 91-19.000.

de Buck van Overstraeten, Jean-Pierre, to Uvetex Glarus AG. Fabric permeable to ultraviolet radiations. 4,115,615, Cl. 428-229.000.

Decker, Bernard J.; and Schmitt, Frederick J. Tree caddy. 4,114,766, Cl. 214-3.000.

Decker, Henry P. Woodworking bench for portable motor driven hand tools. 4,114,665, Cl. 144-286.00R.

Deets, Gary L., to Monsanto Company. Nitrogenous polymer composition emitting reduced amounts of hydrogen cyanide on combustion. 4,115,353, Cl. 260-45.75C.

Deex, Oliver D.; and Weiss, Virgil W., to Monsanto Company. Polyesters of 1,2-bis(hydroxyphenyl)ethanes and aromatic dicarboxylic acids. 4,115,357, Cl. 528-294.000.

Defago, Raymond: *See—*
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,115,056, Cl. 8-39.00B.

DeFeo, Francesco; Gemini, Vincenzo; and Floridia, Luigi, to Montedison S.p.A. Process for the dyeing of fibrous materials containing basic functions in dyeing baths based on organic solvents. 4,115,057, Cl. 8-54.000.

Degen, Peter John; and Lucas, Anthony James, to Minnesota Mining and Manufacturing Company. Sunscreening compositions. 4,115,547, Cl. 424-60.000.

De Haan, Friedrich Jacobus, administrator: *See—*
Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and De Haan, Friedrich Jacobus, administrator, 4,114,406, Cl. 68-24.000.

Dekeister, Roger; Lemaire, Gilbert; and Marzys, Daniel, to Compagnie Royale Asturienne des Mines. Method of electrolytically preparing a metal in pulverulent form. 4,115,210, Cl. 204-10.000.

Del Norte Technology, Inc.: *See—*
Metcalf, James E., 4,115,773, Cl. 343-7.0AG.

Delmon, Bernard; and Van Houte, Ghislain, to Unibra. Gas desulphurization. 4,115,518, Cl. 423-244.000.

DeLong, Donald C.: *See—*
Hamill, Robert L.; Stark, William M.; and DeLong, Donald C., 4,115,552, Cl. 424-118.000.

DelRaso, Americo. Golf putting game apparatus. 4,114,887, Cl. 273-176.0FA.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Weighing and transporting system. 4,114,707, Cl. 177-145.000.

Deluty, Michael E. Friction type exercising device. 4,114,875, Cl. 272-133.000.

Demers, Donald R., to Baird-Atomic, Inc. Method for determining the inorganic and metallo-organic salt content in an organic solvent. 4,115,063, Cl. 23-230.00M.

Den Norske Gipsplatefabrikk A/S: *See—*
Nilsen, Walter, 4,114,345, Cl. 52-745.000.

Dengel, Ferdinand, to Knoll AG. Method for making basically-substituted phenylacetonitriles. 4,115,432, Cl. 260-465.00E.

Denis, Vintsentas Ionovich: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Denjean, Rene, to Air Industrie. Processes and installations for melting pig-iron in a cupola furnace. 4,114,862, Cl. 266-44.000.

Denman, Stephen A. Strip type coupling member. 4,115,609, Cl. 428-68.000.

Denny, Dann W., to General Electric Company. Thermostat, method of operating such electrical circuit and method of heating a temperature sensing means. 4,114,681, Cl. 165-26.000.

Denny, Dann W.: *See—*
Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 4,115,674, Cl. 200-329.000.

Deno, Kohji, to Murata Kikai Kabushiki Kaisha. Means for transferring, collecting and distributing trolleys in conveyer system. 4,114,539, Cl. 104-165.000.

Dent, Robert K. Method of fixing a threaded tube to a threaded shank or nipple. 4,114,250, Cl. 29-517.000.

Dentalwerk Burmoos Gesellschaft m.b.H.: *See—*
Malata, Peter; and Buchsteiner, Josef, 4,114,276, Cl. 32-26.000.

Dentsply Research and Development Corporation: *See—*
Gonser, Donald I., 4,114,622, Cl. 128-303.140.

Deschamps, Bernard F.: *See—*
Macuga, Henry J.; and Deschamps, Bernard F., 4,114,326, Cl. 52-28.000.

Deshpande, Narayan V., to Xerox Corporation. Resilient lithographic masters for direct printing. 4,114,535, Cl. 101-141.000.

Detecto Scales, Inc.: *See—*
Jacobs, Maxwell E.; and Aaldenberg, Eric R., 4,114,709, Cl. 177-156.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Note frequency generator for a polyphonic tone synthesizer. 4,114,496, Cl. 84-1.100.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Dieckelmann, Gerhard; Jeromin, Lutz; and Tollkotter, Gunther, 4,115,411, Cl. 260-348.260.

Deutsche Texaco Aktiengesellschaft: *See—*
Grasshoff, Hans Dieter, 4,115,282, Cl. 252-18.000.

de Villepoix, Raymond: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,114,907, Cl. 277-206.00R.

de Weger, Dirk, to Zenith Radio Corporation. Doubly balanced demodulator for multiple channel FM stereo system. 4,115,663, Cl. 179-15.0BT.

de Wit, Hendrik; and Frentzel, Kurt Heinz, to Hunter Douglas International N.V. Locking mechanism for vertical slat blind. 4,114,673, Cl. 160-166.00A.

Dewitte, Jean; and Letourneur, Pierre, to Compagnie Internationale de Minerallurgie-CIM. Method for casting vitreous materials using the lost wax process. 4,115,504, Cl. 264-221.000.

Dey, Arabinda N.; and Him, James H., to P.R. Mallory & Co. Inc. Hermetic vent structure. 4,115,629, Cl. 429-56.000.

de Zeeuw, Hotze Jan. Apparatus and method for particle separation and grading. 4,115,256, Cl. 209-3.000.

Diamond, Barry S.: *See—*
Lello, Diane L.; and Diamond, Barry S., 4,114,915, Cl. 280-47.190.

Diamond, Julius, to Cooper Laboratories, Inc. Carbamylguanidine antimicrobial compounds. 4,115,447, Cl. 260-553.00R.

Diamond, Julius, to Cooper Laboratories, Inc. Carbamylguanidine antimicrobial compounds. 4,115,448, Cl. 260-553.00A.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Treatment of diarrhea with amidinoureas. 4,115,564, Cl. 424-244.000.

Diamond Shamrock Corporation: *See—*
Lemanski, Michael F.; Leitert, Frederick C.; and Vinson, Carl G., Jr., 4,115,323, Cl. 252-455.00R.

Di Blasio, John A., to Brandt-Pra, Inc. Document handling and counting device having guide fingers for facilitating the feeding of curled, folded and creased documents and further having improved outfeed stacker means for facilitating the neat stacking of documents of the aforementioned type. 4,114,870, Cl. 271-35.000.

DiCecio, Salvatore A., to Avmar, Incorporated. Wheel and brake advisory system for aircraft. 4,115,756, Cl. 340-27.00R.

Diceon Electronics, Inc.: *See—*
Carlson, Carl S.; Kinsella, Lawrence M.; and Pixley, Daniel L., 4,115,185, Cl. 156-634.000.

Didde-Glaser, Inc.: *See—*
Gladow, Dean E.; and Clifton, Kenneth C., 4,114,869, Cl. 270-37.000.

Diebolder, Helmut. Cable drum with rotatable positioning. 4,114,826, Cl. 242-85.000.

Dieckelmann, Gerhard; Jeromin, Lutz; and Tollkotter, Gunther, to Henkel Kommanditgesellschaft auf Aktien; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Continuous process for epoxidizing organic compounds containing olefinic double bonds. 4,115,411, Cl. 260-348.260.

Diena, Benito B.: *See—*
Wallace, Rebecca; Ashton, Fraser E.; Perry, Malcolm B.; and Diena, Benito B., 4,115,543, Cl. 424-8.000.

Diesch, Robert E.: *See*—
Jensen, Gerald A.; Larson, Louis A.; and Diesch, Robert E., 4,114,349, Cl. 53-54.000.

Dietrich, Toni: *See*—
Kramer, Klaus; Dietrich, Toni; and Braun, Peter, 4,115,802, Cl. 358-93.000.

Dietzel, Walter; and Athenstedt, Martin, to Braunschweigische Maschinenbauanstalt. Diffusion tower for sugar beet cossettes. 4,115,145, Cl. 127-5.000.

Digenis, George A.; Shambhu, Manvendra B.; and Theodorakis, Michael C., to University of Kentucky Research Foundation, The. Radiodiagnostic agent. 4,115,540, Cl. 424-1.000.

DiGiacomo, Hector L.; and Sacco, John A., to General Battery Corporation. Industrial battery stack, and apparatus and method for stacking, aligning and burning same. 4,114,260, Cl. 29-623.100.

Digital Facilities, Inc.: *See*—
Axtell, Clyde R., III, 4,115,731, Cl. 324-52.000.

Dikeman, Forrest L.; and Wilkinson, Robert C. Squeeze type exerciser device with force measuring gauge. 4,114,449, Cl. 73-379.000.

Dinning, Robert W., to Brown Oil Tools, Inc. No-shock pressure plug apparatus. 4,114,694, Cl. 166-318.000.

Direct Power Limited: *See*—
Butler, Stanley Milton, 4,115,037, Cl. 417-341.000.

Disko, Eberhard, to Carl Freudenberg, Firma. Mop comprising bonded nonwoven fabric absorptive elements. 4,114,224, Cl. 15-229.00A.

Dismukes, Newton Bradford. Recovery of petroleum. 4,114,689, Cl. 166-249.000.

Dobras, Bruce W., to Monarch Marking Systems, Inc. Hand held optical reading device. 4,115,703, Cl. 250-568.000.

Doby, William P., to Westinghouse Electric Corp. Electric load research device including an enclosure having adjustable meter positions. 4,115,835, Cl. 361-370.000.

Dode, Peter Francis; and Hawkins, Michael Francis, to Gascoigne Gush & Dent (Agricultural) Limited. Milking system and a valve therefor. 4,114,565, Cl. 119-14.010.

Dodson, Stuart Alan: *See*—
Douglas, George Henry; Studt, William Lyon; and Dodson, Stuart Alan, 4,115,647, Cl. 544-63.000.

Doi, Toshio: *See*—
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.

Dokin, Viktor Alexeevich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Dolhyj, Serge R.: *See*—
Bartek, Joseph P.; Dolhyj, Serge R.; Velenyi, Louis J.; and Grasselli, Robert K., 4,115,464, Cl. 260-668.00C.

Dominguez, Edward. Identification of gemstones by relative reflectance measurements coupled with a scale calibrated in gem names. 4,114,936, Cl. 292-342.000.

Dominion Auto Accessories Limited: *See*—
Nagel, Robert I., 4,115,843, Cl. 362-291.000.

Doolittle, Mac R., to Clark Equipment Company. Steering mechanism. 4,114,724, Cl. 180-155.000.

Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, to Carlo Erba S. p. A. 6-Carboxy-2-(2'-pyrazinyl)-chromones and esters thereof. 4,115,567, Cl. 424-250.000.

Dorian, Mark: *See*—
Nelson, David H., 4,115,177, Cl. 156-245.000.

Dorr-Oliver Incorporated: *See*—
Jukkola, Walfred Wilhelm; and Tomasicchio, Giorgio, 4,115,070, Cl. 422-142.000.

Dorreboom, Jelmer, to Spin Physics, Inc. Method of making a high density multitrack magnetic head. 4,114,259, Cl. 29-603.000.

D'Orto, Michael D.: *See*—
Gershberg, David N.; Lee, Alexander Y.; and D'Orto, Michael D., 4,115,781, Cl. 343-768.000.

Dory, Jacques, to CGR Ultrasonic. Ultrasonic device for cutting sections of constant weight from a tubular blank. 4,114,456, Cl. 73-622.000.

Double A Products Company: *See*—
Johnson, Charles E., 4,114,637, Cl. 137-116.000.

Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 4,115,564, Cl. 424-244.000.

Douglas, George Henry; Studt, William Lyon; and Dodson, Stuart Alan, to William H. Rorer, Inc. Amidinoureas. 4,115,647, Cl. 544-63.000.

Dow Chemical Company, The: *See*—
Clark, Michael J.; and Rohrmoser, Howard L., 4,115,080, Cl. 55-54.000.
Kurfman, Virgil B.; and Gransden, Raymond E., Jr., 4,115,619, Cl. 428-336.000.
Mahoney, Robert D.; and Schneider, Stephen E., 4,115,492, Cl. 264-49.000.
Pawloski, Chester E., 4,115,557, Cl. 424-200.000.
Smith, Harry A., 4,115,365, Cl. 528-132.000.
Spencer, David R.; and Archer, Wesley L., 4,115,461, Cl. 260-652.50R.

Dow Corning Corporation: *See*—
Hilliard, John R., 4,115,356, Cl. 528-18.000.

Downs, John D., to Mobil Oil Corporation. Polyol intermediate, polyesters made therefrom, and polyester coating compositions. 4,115,473, Cl. 260-850.000.

Dowty Mining Equipment Limited: *See*—
Rutherford, Dennis Franklin, 4,114,387, Cl. 405-293.000.

Doyel, John S. Hand-held, battery-operated decorative extruder for cookie dough and similar food substances. 4,114,781, Cl. 222-326.000.

Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,115,583, Cl. 424-300.000.

Draese, Rudiger: *See*—
Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,115,427, Cl. 260-448.20E.

Drees, Jan M.; Sonneborn, Walter G. O.; and Yen, Jing G., to Textron, Inc. Hub spring moment isolation in underslung two-bladed teetering rotor. 4,115,031, Cl. 416-134.00A.

Drellishak, Glen J.: *See*—
Marchak, Roman O.; and Drellishak, Glen J., 4,114,570, Cl. 123-32.0EG.

Dresser Industries, Inc.: *See*—
Stratienko, Andrew, 4,114,469, Cl. 74-424.8VA.
Stratienko, Andrew, 4,114,474, Cl. 74-625.000.

Driessen, Frans M.; Ubbels, Jacob; and Stadhouders, Jacobus J., to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek. Device for generating shearing forces in treating yogurt and other viscous liquids or gels. 4,114,525, Cl. 99-465.000.

Driscoll, Richard C.; and Morejon, Clara B., to American Hospital Supply Corporation. Resin tablet and use thereof in diagnostic tests. 4,115,537, Cl. 424-1.000.

Dubner, Evgeny Mikhailovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Ducret, Jacques: *See*—
Lacroix, Guy; Debourge, Jean-Claude; and Ducret, Jacques, 4,115,559, Cl. 424-209.000.

Duffy, Neil David: *See*—
Leach, Leslie Alan; Riddoch, Henry Jamieson; and Duffy, Neil David, 4,114,893, Cl. 274-9.0RA.

Dugge, Richard H., to ACF Industries, Incorporated. Control valve for bottom discharge outlet. 4,114,785, Cl. 222-545.000.

Dummermuth, Ernst H., to Allen-Bradley Company. Jump structure for a digital control system. 4,115,853, Cl. 364-200.000.

Dundon, Michael J., to Bandag Incorporated. Retreading stacked tires. 4,115,171, Cl. 156-96.000.

Dungs, Horst: *See*—
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, 4,115,202, Cl. 202-99.000.

Dunks, Gary Burr; and Ordonez, Kathy Palmer, to Union Carbide Corporation. Process for the synthesis of tetradecahydroundecaborate compounds. 4,115,520, Cl. 423-287.000.

Dunks, Gary Burr; and Ordonez, Kathy Palmer, to Union Carbide Corporation. Process for the synthesis of decaborane(14). 4,115,521, Cl. 423-294.000.

Dunlop, James D.: *See*—
Van Ommering, Gerrit; Stockel, Joseph F.; and Dunlop, James D., 4,115,630, Cl. 429-72.000.

Dunn, Robert C. Disc Brake. 4,114,732, Cl. 188-73.200.

Dunn, Robert O.: *See*—
McCarthy, William C.; and Dunn, Robert O., 4,115,264, Cl. 210-63.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Batzar, Kenneth, 4,115,143, Cl. 106-298.000.
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,115,584, Cl. 424-301.000.
Bigelow, John Howard, 4,115,129, Cl. 96-107.000.
Bushey, William Raymond, 4,115,345, Cl. 260-38.000.
Finlay, Joseph Burton; and Omura, Hisanori, 4,115,481, Cl. 260-900.000.
Gerow, Clare William, 4,115,334, Cl. 260-28.50D.
Hazan, Isidor, 4,115,227, Cl. 204-181.00C.
Hess, Richard William, 4,115,142, Cl. 106-288.00B.
Maloney, James Francis, Jr., 4,114,759, Cl. 206-523.000.
Marsh, Frank Dennis, 4,115,384, Cl. 260-239.00E.
Piltingsrud, Douglas Howard, 4,115,141, Cl. 106-288.00B.
Romanauskas, William A., 4,114,803, Cl. 233-26.000.
Schoenholz, Daniel; and Perl, Martin M., 4,115,293, Cl. 252-102.000.
Whitney, George Crosier, III, 4,115,126, Cl. 96-84.00R.

Duzich, John J., to Grumman Aerospace Corporation. Aircraft onboard operational status indicator. 4,115,754, Cl. 340-27.00R.

Dy Yau, Leopoldo: *See*—
Thibault, Louis Robert; and Dy Yau, Leopoldo, 4,114,256, Cl. 29-571.000.

Dyckerhoff & Widmann AG: *See*—
Schambeck, Herbert, 4,114,219, Cl. 14-16.100.

Dyer, Donald R.; Johnson, Claude, Jr.; and Wilbarg, Robert R., to International Business Machines Corporation. Method of forming thin film patterns by differential pre-baking of resist. 4,115,120, Cl. 96-36.200.

Dyment, John Cameron, to Northern Telecom Limited. Method of

producing optoelectronic devices with control of light propagation. 4,115,150, Cl. 148-1.500.
Dynamics Research Corporation: *See—*
Brisk, Richard A.; and Miller, David E., 4,115,859, Cl. 364-476.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,115,427, Cl. 260-448.20E.
E.G. Sprinkler Corporation: *See—*
Goodman, James M., 4,114,414, Cl. 72-105.000.
E.I. DuPont de Nemours and Company: *See—*
Baker, Melvin Charles, 4,115,408, Cl. 260-346.110.
E. R. Squibb & Sons, Inc.: *See—*
Hoehn, Hans; and Schulze, Ernst, 4,115,394, Cl. 260-296.00H.
Krapcho, John; and Turk, Chester F., 4,115,382, Cl. 260-239.00A.
Wade, Peter C.; and Vogt, Berthold Richard, 4,115,555, Cl. 424-180.000.
E-Systems, Inc.: *See—*
Gershberg, David N.; Lee, Alexander Y.; and D'Orto, Michael D., 4,115,781, Cl. 343-768.000.
Earth Sciences, Inc.: *See—*
Pyrih, Roman Z.; and Rickard, Robert S., 4,115,110, Cl. 75-101.00R.
Eastman Kodak Company: *See—*
Etter, Doyle O.; and Crawford, Irvin H., 4,115,125, Cl. 96-83.000.
Hamilton, Lewis R.; and Sutton, Richard C., 4,115,124, Cl. 96-82.000.
Johnson, Robert B., 4,114,831, Cl. 242-194.000.
Wang, Richard H. S.; and Zannucci, Joseph S., 4,115,348, Cl. 260-45.8NZ.
Eberle, Jon W.: *See—*
Lyle, Judge M.; and Eberle, Jon W., 4,114,611, Cl. 128-75.000.
Eckert, Paul: *See—*
Kritzler, Gerhard; and Eckert, Paul, 4,114,680, Cl. 165-4.000.
Eckhardt, Friedrich, to Zinser Textilmaschinen GmbH. Open-end spinning apparatus. 4,114,356, Cl. 57-34.00R.
Eckhart, Lewis. Phonograph tonearm pickup counterbalance. 4,114,895, Cl. 274-23.00R.
Eckle, Manfred: *See—*
Engel, Gerhard; and Eckle, Manfred, 4,115,312, Cl. 252-301.500.
Eclipse Mfg. Inc.: *See—*
Macuga, Henry J.; and Deschamps, Bernard F., 4,114,326, Cl. 52-28.000.
Ecodyne Corporation: *See—*
Saxton, Forest Jackson, 4,115,484, Cl. 261-111.000.
Econo Fuel Systems, Inc.: *See—*
Harpman, Webster B.; and Mahoney, Fred G., 4,114,566, Cl. 123-25.00B.
Edward R. Langfield: *See—*
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,114,951, Cl. 299-22.000.
Eff, Christian A., to General Electric Company. Oscillatory drive means for a rotisserie spit. 4,114,523, Cl. 99-393.000.
Effbe-Werk Fritz Brumme & Co. K.G.: *See—*
Weisenberger, Gottfried, 4,114,845, Cl. 248-24.000.
Efficiency Production, Inc.: *See—*
Nieber, Allen J., 4,114,383, Cl. 405-282.000.
Egan, William F., to GTE Sylvania Incorporated. Phase lock speed-up circuit. 4,115,745, Cl. 331-17.000.
Eggelsmann, Harry, to U.S. Philips Corporation. Rotary-anode X-ray tube. 4,115,718, Cl. 313-60.000.
Eggenberger, John S.; and Hodges, Paul, to International Business Machines Corporation. Sequential encoding and decoding of variable word length, fixed rate data codes. 4,115,768, Cl. 340-347.0DD.
Eggleston, Robert M.: *See—*
Bergquist, Dwight H.; Cunningham, Franklin E.; and Eggleston, Robert M., 4,115,592, Cl. 426-32.000.
Egli, Christian: *See—*
Rossi, Alberto; and Egli, Christian, 4,115,416, Cl. 260-413.000.
Eguchi, Seiji: *See—*
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,115,868, Cl. 364-900.000.
EIC International Corporation: *See—*
Hsu, Sheau-Po, 4,114,793, Cl. 227-63.000.
Eichhorst, Gustav E. Method and apparatus for controlling the wheel brakes to prevent skid. 4,114,957, Cl. 303-96.000.
Eichinger, Anton: *See—*
Bauer, Heinrich Franz; Eichinger, Anton; and Feitzelmayer, Ernst, 4,115,174, Cl. 156-155.000.
Eifler, Willi: *See—*
Raue, Roderich; Eifler, Willi; and Kuhlthau, Hans-Peter, 4,115,413, Cl. 260-390.000.
Eimers, Erich: *See—*
Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, 4,115,379, Cl. 260-163.000.
Eisenhardt, William Anthony, Jr.; Hedaya, Eddie; and Theodoropulos, Spyros, to Union Carbide Corporation. Analytical or clinical derivatives, tagged derivatives and methods of analysis using such derivatives. 4,115,539, Cl. 424-1.000.
Ejiri, Masakazu: *See—*
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, 4,115,761, Cl. 340-146.3AC.
Ekstrand, Stig, to AB Akerlund & Rausing. Laminated paper product and a method for manufacturing said product. 4,115,176, Cl. 156-244.250.
Elettrocarbonium S.p.A.: *See—*
Ubaldi, Luciano; and Buccella, Osvaldo, 4,114,562, Cl. 118-50.000.
Elex A.G.: *See—*
Huppi, Xaver Johann, 4,115,083, Cl. 55-148.000.
Elfert, Klaus; Rosenkranz, Hans Jurgen; and Rudolf, Hans, to Bayer Aktiengesellschaft. Separation of aromatic hydrocarbons from mixtures, using polyurethane membranes. 4,115,465, Cl. 260-674.00R.
Eli Lilly and Company: *See—*
Blanchard, William B.; and Ryan, Charles W., 4,115,403, Cl. 260-340.90R.
Chou, Ta Sen; and Zintgraff, Gary D., 4,115,644, Cl. 544-20.000.
Cooper, Robin D. G., 4,115,383, Cl. 260-239.00A.
Hamill, Robert L.; Stark, William M.; and DeLong, Donald C., 4,115,552, Cl. 424-118.000.
Jackson, Billy G.; and McPherson, Roger E., 4,115,645, Cl. 544-20.000.
Kukolja, Stjepan; and Spry, Douglas O., 4,115,643, Cl. 544-16.000.
Queener, Stephen W.; and Nash, Claude H., III, 4,115,197, Cl. 195-36.00R.
Thompson, Gerald L.; and Paschal, Gloria C., 4,115,388, Cl. 260-287.00B.
Zimmerman, Dennis M., 4,115,400, Cl. 260-326.50B.
Elkem-Spigerverket A/S: *See—*
Ydstie, Birger Leif, 4,115,108, Cl. 75-11.000.
Eller, Fritz. Switching bearing assembly for a motor-driven spindle. 4,114,747, Cl. 192-150.000.
Ellwanger, Richard Earl, to American Cyanamid Company. Inversion of water-in-oil emulsions of polyacrylamide in hard water. 4,115,340, Cl. 260-29.6HN.
Elmer, Stefan: *See—*
Jansen-Herfeld, Rottger; and Elmer, Stefan, 4,114,270, Cl. 30-394.000.
Elopak A/S: *See—*
Halmo, Terje Martin; and Skoglund, Liv, 4,115,497, Cl. 264-115.000.
EMI Limited: *See—*
Hounsfield, Godfrey Newbold; and Williams, Anthony Michael, 4,115,697, Cl. 250-445.00T.
Hounsfield, Godfrey Newbold, 4,115,698, Cl. 250-445.00T.
Oldendorf, William Henry, 4,115,691, Cl. 250-312.000.
Emmons, Johnny Dale. Pigging string and method of manufacture. 4,114,360, Cl. 57-142.000.
Emmons, William D.; Kim, Samuel S.; and Winey, Donald A., to Rohm and Haas Company. Polyfunctional ester ketimines, adhesives derived therefrom and method for adhering materials. 4,115,169, Cl. 156-71.000.
Empisal Knitmaster Luxembourg S.A.: *See—*
Bartels, Manfred, 4,114,405, Cl. 66-75.200.
Enchelmaier, Harvard W. K. Helically wound brush. 4,114,221, Cl. 15-182.000.
Endo Laboratories, Inc.: *See—*
Rajagopalan, Parthasarathi, 4,115,577, Cl. 424-256.000.
Endriz, John Guiry, to RCA Corporation. Electron beam oscillation compensation method. 4,115,724, Cl. 315-169.0TV.
Energy Development Associates: *See—*
Behling, Harvey L., 4,115,529, Cl. 423-472.000.
Engel, Gerhard; and Eckle, Manfred, to Merck Patent Gesellschaft mit beschrankter Haftung. X-ray fluorescent luminescent cadmium tungstate compositions. 4,115,312, Cl. 252-301.500.
Engelhard, Thomas. Window boot. 4,114,943, Cl. 296-23.0MC.
Engelhardt, Hans-Peter: *See—*
Kunkele, Rudolf; and Engelhardt, Hans-Peter, 4,115,133, Cl. 106-56.000.
Engelsmann, Dieter; Hackenberg, Hubert; and Zobel, Siegfried, to AGFA-Gevaert AG. Film transport mechanism for cameras. 4,115,792, Cl. 354-213.000.
Engelsmann, Dieter: *See—*
Fauth, Gunter; and Engelsmann, Dieter, 4,115,791, Cl. 354-206.000.
Engle, Donald D., Jr.; and Utt, Michael E., to Union Oil Company of California. Lateral support members for a tension leg platform. 4,114,393, Cl. 114-264.000.
English Electric Valve Company Limited: *See—*
Brady, Michael Barry; and Lewis, Peter Frederick, 4,115,746, Cl. 331-90.000.
Enomoto, Masahisa: *See—*
Ogisu, Kenji; and Enomoto, Masahisa, 4,115,213, Cl. 204-39.000.
Enomoto, Masao, to Ichikoh Industries, Limited. Mirror angle adjusting device, with consecutively driven worms in remotely controlled rear-view mirror apparatus. 4,114,988, Cl. 350-289.000.
Enso-Gutzeit Osakeyhtio: *See—*
Paakkinen, Ilmari; Hakkinen, Seppo; and Matula, Jouni, 4,114,818, Cl. 241-244.000.
Entenmann, Charles E., to Entenmann's Bakery, Inc. Baking and packaging system. 4,114,760, Cl. 206-562.000.
Entenmann's Bakery, Inc.: *See—*
Entenmann, Charles E., 4,114,760, Cl. 206-562.000.
Eppinger, Kurt Hermann: *See—*
Bolto, Brian Alfred; and Eppinger, Kurt Hermann, 4,115,297, Cl. 521-32.000.
Erb, Robert Allan, to Franklin Institute, The. Unitary solar collector. 4,114,597, Cl. 126-271.000.
Erco Industries Limited: *See—*
McGilvery, James D., 4,115,307, Cl. 252-135.000.
Ericson, Hans Goran; and Steneras, Bo Sanfrid Emanuel, to Volvo BM AB. Dual steering system for vehicles. 4,114,720, Cl. 180-133.000.
Ernyei, Herbert; and Langlois, Etienne, to Societe Telegraphiques et Telephoniques. Method of measuring the resonance frequency of mechanical resonators. 4,114,454, Cl. 73-579.000.

Erpenbeck, Paul J., to Breneman, Inc. Apparatus and method for rotary cutting of rolled window shades and the like. 4,114,266, Cl. 30-123.000.

Escher Wyss Limited: *See—*
Christ, Alfred, 4,114,959, Cl. 308-3.500.

Eskes, Hendrik J. K.: *See—*
Beernaerts, Andre M. H. J.; and Eskes, Hendrik J. K., 4,114,213, Cl. 5-345.00R.

Estaque, Andre, to Societe Anonyme Automobiles Citroen. Control devices for transmissions of automotive vehicle engines. 4,114,480, Cl. 74-865.000.

Esteve-Subirana, Antonio, to Laboratorios del Dr. Esteve, S.A. 2,5-Dihydroxy benzene sulfonic acid mono esters. 4,115,648, Cl. 544-110.000.

Estrin, Arkady Samuilovich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Etablissement Public Dit Telediffusion de France: *See—*
Guinet, Yves Maurice; and Noirel, Yves Maurice, 4,115,662, Cl. 179-15.0BV.

Etat Francais: *See—*
Melchior, Jean; and Andre, Thierry, 4,114,379, Cl. 60-606.000.

Ethyl Corporation: *See—*
Lerner, Sidney I., 4,115,590, Cl. 424-337.000.

Etter, Doyle O.; and Crawford, Irvin H., to Eastman Kodak Company. Polymeric films peelably adhered to a pressure-sensitive adhesive photographic element. 4,115,125, Cl. 96-83.000.

Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., to Ciba-Geigy AG. Silver halide color photographic material containing yellow coupler. 4,115,121, Cl. 96-56.300.

Everman, Wayne Fredrick: *See—*
Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, 4,115,779, Cl. 343-715.000.

Evers, Robert C., to United States of America, Air Force. Perfluoroalkylene ether bibenzoxazole polymers. 4,115,367, Cl. 528-210.000.

Every, Richard L.; and Jacob, Jose T., to Chemed Corporation. Production of raw mix cement slurries having reduced water content. 4,115,139, Cl. 106-100.000.

Extracorporeal Medical Specialties, Inc.: *See—*
Winstead, Thomas W., 4,115,273, Cl. 210-321.00A.

Exxon Research and Engineering Company: *See—*
Burke, Oliver W., Jr., 4,115,316, Cl. 252-359.00A.
Colclough, Terence; and Swinney, Brian, 4,115,287, Cl. 252-48.200.
Oswald, Alexis A.; and Lesser, Joseph H., 4,115,482, Cl. 260-957.000.
Tenner, Arthur R.; and Turner, David W., 4,115,515, Cl. 423-235.000.

Eymard, Pierre: *See—*
Nanthavong, Souli; Pigerol, Charles; Eymard, Pierre; and Simiand, Jacques, 4,115,401, Cl. 260-326.430.

F. L. Smidth & Co.: *See—*
Hansen, Dan S., 4,115,136, Cl. 106-100.000.

Fa. August Thiele: *See—*
Verse, Egon, 4,114,367, Cl. 59-85.000.

Fabian, Wolfgang: *See—*
Gall, Ludwig; and Fabian, Wolfgang, 4,115,386, Cl. 260-281.00P.

Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, to List, Hans. Motor vehicle having sound-suppressing engine enclosure. 4,114,714, Cl. 180-54.00A.

Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Organophosphorus nickel complexes and use thereof. 4,115,470, Cl. 260-683.15D.

Fairchild Camera and Instrument Corporation: *See—*
Hingarh, Hemraj K.; and Crippen, Richard E., 4,115,797, Cl. 357-46.000.

Falconbridge Nickel Mines Limited': *See—*
Pasieka, Arnold Roy; Wilson, John Corner; and Moruzi, George Alexander, 4,114,954, Cl. 302-14.000.

Falconer, Robert P.: *See—*
Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., 4,114,789, Cl. 224-42.10E.

Falk Corporation, The: *See—*
Phinney, John M., 4,114,745, Cl. 192-0.098.

Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 4,114,297, Cl. 36-50.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Cinching closure. 4,114,297, Cl. 36-50.000.

Fan, John C. C.: *See—*
Henrich, Victor E.; and Fan, John C. C., 4,115,228, Cl. 204-192.0EC.

Fancher, Llewellyn W., to Stauffer Chemical Company. Hydrazone dithiophosphates and phosphonates and use thereof as insecticides. 4,115,558, Cl. 424-205.000.

Fansteel, Inc.: *See—*
Cecka, Andrew M., 4,114,880, Cl. 273-73.00G.

Fastenmeier, Karl: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, 4,114,623, Cl. 128-303.140.

Fatur, Richard N.: *See—*
Brown, Vaikai K.; and Fatur, Richard N., 4,114,738, Cl. 192-4.00A.

Faultfinders, Inc.: *See—*
Stanford, Melvin E., 4,115,735, Cl. 324-158.00F.

Faup, John Joseph; and Wolf, David Harvey, to Otis Elevator Company. Elevator safety arrangement. 4,114,731, Cl. 187-29.00R.

Fauth, Gunter; and Engelsmann, Dieter, to AGFA-Gevaert AG. Film-transporting and shutter-cocking mechanism for still cameras. 4,115,791, Cl. 354-206.000.

Fazio, Rodolfo: *See—*
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, 4,115,816, Cl. 358-283.000.

Feamster, William C., III. Pipe cutting or end prepping apparatus. 4,114,484, Cl. 82-4.00C.

Fearnley, Charles; Fordham, Glenda Helen; and Lee, Frank, to Ciba-Geigy Corporation. Bactericidal soap bar. 4,115,294, Cl. 252-106.000.

Fechtig, Bruno: *See—*
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,115,566, Cl. 424-246.000.

Fecker, Josef; and Memminger, Gustav, to Memminger, Gustav. Yarn delivery apparatus for use with textile machines. 4,114,823, Cl. 242-47.010.

Federal Paper Board Co., Inc.: *See—*
Manizza, Guelfo A., 4,114,797, Cl. 229-31.00R.

Feitzelmayer, Ernst: *See—*
Bauer, Heinrich Franz; Eichinger, Anton; and Feitzelmayer, Ernst, 4,115,174, Cl. 156-155.000.

Felcman, Frances Adolph: *See—*
Wood, James Carlos; and Felcman, Frances Adolph, 4,115,014, Cl. 400-611.000.

Fellner, Helmut: *See—*
Pockrandt, Gunter; and Fellner, Helmut, 4,115,079, Cl. 55-43.0BN.

Fentress, D. G. Portable, collapsible furniture. 4,114,542, Cl. 108-157.000.

Ferni, Giovanni: *See—*
Manghisi, Elso; Salimbeni, Aldo; and Ferni, Giovanni, 4,115,585, Cl. 424-311.000.

Ferranti Limited: *See—*
Shepherd, Alexander Turnbull, 4,115,008, Cl. 356-172.000.

Fertl, Walter H.; and Gant, Preston L., to Continental Oil Company. Mining and drilling control of distance to the coal-shale interface - thorium measurement by gamma spectrometry. 4,115,688, Cl. 250-253.000.

FIAT Societa per Azioni: *See—*
Cattaneo, Maurizio; and Bertone, Antonino, 4,114,376, Cl. 60-548.000.

Fiato, Rocco Anthony: *See—*
Cosby, Lowell Alan; Fiato, Rocco Anthony; and Vidal, Jose Luis, 4,115,433, Cl. 260-449.00L.

Fick, Willy Julius, to Danfoss A/S. Apparatus for ultrasonically measuring physical parameters of flowing media. 4,114,439, Cl. 73-194.00A.

Fields, Joseph E.; and Johnson, John H., to Monsanto Company. Composition for lowering blood cholesterol level. 4,115,550, Cl. 424-78.000.

Figueredo, Hector: *See—*
Marchio, John P.; and Figueredo, Hector, 4,114,267, Cl. 30-172.000.

Fini, Anthony W., Jr. Automatic torque stick transmission. 4,114,476, Cl. 74-745.000.

Finlay, Joseph Burton; and Omura, Hisanori, to Du Pont de Nemours, E. I., and Company. Fluoroelastomer blend composition. 4,115,481, Cl. 260-900.000.

Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., to FMC Corporation. N-sulfonylimidazoles as peroxygen activators. 4,115,060, Cl. 8-111.000.

Finley, Joseph H.: *See—*
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,115,058, Cl. 8-111.000.

Finta, Laszlo. Motor vehicle with special arrangement of front wheels, front door, driver's cabin and engine. 4,114,712, Cl. 180-21.000.

Firmenich SA: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,114,630, Cl. 131-17.00R.

Fischbeck, Kenneth H., to Xerox Corporation. Separable liquid droplet instrument and piezoelectric drivers therefor. 4,115,789, Cl. 346-140.00R.

Fischenich, Bernhard: *See—*
Luepertz, Hans-Henning; and Fischenich, Bernhard, 4,114,430, Cl. 73-121.000.

Fischer, Artur; and Fischer, Klaus, to Fischer, Artur. Anchoring arrangement kit. 4,114,329, Cl. 52-173.00R.

Fischer, Donald A.; Lipowski, Edwin M.; and Kalt, William E., to Kalt Manufacturing Company, The. Drill screw. 4,114,507, Cl. 85-41.000.

Fischer, Klaus: *See—*
Fischer, Artur; and Fischer, Klaus, 4,114,329, Cl. 52-173.00R.

Fischer, Ulf; and Wyss, Pierre-Charles, to Hoffmann-La Roche Inc. Ribofuranosyl-imidazole derivatives. 4,115,641, Cl. 536-23.000.

Flachenecker, Gerhard: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, 4,114,623, Cl. 128-303.140.

Flanders, Robert L.; and Blanton, William A., Jr., to Chevron Research Company. Method for removing pollutants from catalyst regenerator flue gas. 4,115,250, Cl. 208-120.000.

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Flanders, Robert L.: *See*—
Blanton, William A., Jr.; and Flanders, Robert L., 4,115,249, Cl. 208-120.000.

Fleche, Guy: *See*—
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.

Flexowall Corporation: *See*—
Plaut, Werner P. B., 4,114,531, Cl. 100-90.000.

Floridia, Luigi: *See*—
DeFeo, Francesco; Gemini, Vincenzo; and Floridia, Luigi, 4,115,057, Cl. 8-54.000.

Florjancic, Dusan; and Matthias, Heinz-Bernd, to Klein, Schanzlin & Becker Aktiengesellschaft. Centrifugal pump. 4,115,029, Cl. 415-211.000.

Fluent, Donald E.: *See*—
Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, 4,115,779, Cl. 343-715.000.

Fluor Corporation: *See*—
Jordan, Charles H.; and Sampat, Ajit, 4,115,086, Cl. 62-28.000.

Flynn, Charles S., to Blu-Surf, Inc. Web stock treating oven. 4,115,052, Cl. 432-72.000.

FMC Corporation: *See*—
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,115,058, Cl. 8-111.000.
Blumbergs, John H.; and Scholer, Fred R., 4,115,059, Cl. 8-111.000.
Finley, Joseph H.; Brubaker, Gaylen R.; and Baum, Burton M., 4,115,060, Cl. 8-111.000.
Lochte, Glen E., 4,114,928, Cl. 285-18.000.
Sticker, Robert Earl, 4,115,096, Cl. 71-92.000.

Ford Motor Company: *See*—
Han, Ching C.; and Gould, Harry J., 4,115,782, Cl. 343-779.000.
Rogerson, Jerry B.; and Harrison, Robert S., 4,114,584, Cl. 123-179.00G.
Siegl, Walter O., 4,115,397, Cl. 260-296.00T.

Fordham, Glenda Helen: *See*—
Fearnley, Charles; Fordham, Glenda Helen; and Lee, Frank, 4,115,294, Cl. 252-106.000.

Forman, Hugh M., to Will Ross Inc. Drain valve. 4,114,640, Cl. 137-381.000.

Fort, William G. S.; and Lee, William W., Jr., to United States of America, Energy. Process gas solidification system. 4,115,073, Cl. 23-293.00R.

Fory, Werner: *See*—
Schurter, Rolf; Rempfler, Hermann; and Fory, Werner, 4,115,100, Cl. 71-94.000.

Fost, Dennis Lynn: *See*—
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,115,584, Cl. 424-301.000.

Foster, C. Mackay, Jr.: *See*—
Patton, Bobbie J.; Sexton, James H.; Gravley, Wilton; and Foster, C. Mackay, Jr., 4,114,435, Cl. 73-151.500.

Foster, Victor W.: *See*—
daCosta, Harry H.; Foster, Victor W.; and Thornton, Charles G., deceased, 4,115,713, Cl. 310-49.00R.

Foster, William R.; and Snavely, Earl S., Jr., to Mobil Oil Corporation. Method of treating formation to remove ammonium ions without decreasing permeability. 4,114,693, Cl. 166-305.00R.

Fotel Inc.: *See*—
Nachtrieb, Robert W., 4,115,003, Cl. 355-133.000.

Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, to Compagnie des Terminaux Marins Coterm; and Spetsialnoe Konstruktorskoe Bjuro "Transnefteavtomatika". Safety connection device for interconnecting two piping elements. 4,114,638, Cl. 137-242.000.

Fournier, Yves J. Miniature reed-type valve. 4,114,852, Cl. 251-138.000.

Fowler, Joe W. Bulk cure tobacco barn with improvements in construction for optimizing heating efficiency. 4,114,288, Cl. 34-93.000.

Fowler, Peter L.: *See*—
McKerrow, George C.; Pelletier, Albert; and Fowler, Peter L., 4,114,865, Cl. 266-136.000.

Fowler, Ray, to Davy Powergas Limited. Hydrocarbon conversion process. 4,115,467, Cl. 260-683.00R.

Foy, Paul; and Kern, Rene, to Ato Chimie. Method to prepare copolyesteramides for moulding. 4,115,475, Cl. 260-857.0PE.

Frahm Fireplace Grate Co., Inc.: *See*—
Frahm, Harlan C., 4,114,590, Cl. 126-121.000.

Frahm, Harlan C., to Frahm Fireplace Grate Co., Inc. Air feed fireplace grate. 4,114,590, Cl. 126-121.000.

Frain, William E.: *See*—
Schwerdtfeger, Lee; Stillman, Lee E.; and Frain, William E., 4,115,784, Cl. 343-915.000.

Franc, Eugene K. Automatic swimming pool cleaning system. 4,114,206, Cl. 4-172.000.

Franck, Bent, to Dansk Signal Industri A/S. Cable connector. 4,114,262, Cl. 29-628.000.

Frank, Earl E., to Abex Corporation. Tongue switch for rail installations. 4,114,844, Cl. 246-162.000.

Franklin Institute, The: *See*—
Erb, Robert Allan, 4,114,597, Cl. 126-271.000.

Franz, John E.; and Howe, Robert K., to Monsanto Company. 5-Aryl-1,2,4-thiadiazole-3-carboxylates and agricultural methods. 4,115,095, Cl. 71-90.000.

Franz, John E., to Monsanto Company. Dicyanovinylhydrazonomalononitriles and the herbicidal use thereof. 4,115,104, Cl. 71-105.000.

Franz Klaus-Union: *See*—
Knorr, Manfred, 4,115,040, Cl. 417-420.000.

Fraser, Douglas S., to FTS Systems, Inc. Acid resistant freeze drying trap. 4,114,287, Cl. 34-92.000.

Frederiksen, John E., to Texas Instruments Incorporated. Electronic timepiece. 4,114,362, Cl. 58-4.00A.

Freeberg, Fred. Motor vehicle wheel track sanding device. 4,114,932, Cl. 291-33.000.

Freeborn, Lowell C.: *See*—
Budke, Robert L.; and Freeborn, Lowell C., 4,114,494, Cl. 83-835.000.

Freed, Robert: *See*—
Bach, Frederick O.; Chapin, Leo N.; and Freed, Robert, 4,115,289, Cl. 252-62.10P.

Frei, Jorg; Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. 2-(3-Amino-2-hydroxy-propoxy)-pyrazines. 4,115,575, Cl. 424-250.000.

Freimark, Ronald J.: *See*—
Young, Thomas A.; and Freimark, Ronald J., 4,115,729, Cl. 322-86.000.

Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., to Research Corporation. Method of determining ion activity using coated ion selective electrodes. 4,115,209, Cl. 204-1.00T.

Frentzel, Kurt Heinz: *See*—
de Wit, Hendrik; and Frentzel, Kurt Heinz, 4,114,673, Cl. 160-166.00A.

Frey, Elmer L.: *See*—
Smashey, Russell W.; Frey, Elmer L.; Cash, George V.; and Irons, George S., 4,115,112, Cl. 75-171.000.

Frey, Thomas M.; and Pond, Stephen F., to Xerox Corporation. Constant wavelength magnetic recording. 4,115,786, Cl. 346-74.100.

Friederich Justus & Co.: *See*—
Vornfett, Karl-Ulrich, 4,114,488, Cl. 83-198.000.

Friedman, Jerome D. Shield for high power infrared laser beam. 4,114,985, Cl. 350-266.000.

Friedrich, Adolf: *See*—
Linhart, Karl; and Friedrich, Adolf, 4,115,652, Cl. 568-706.000.

Fritsch, Werner: *See*—
Grandin, Friedrich-Hans; Fritsch, Werner; and Wengenrod, Gunter, 4,115,685, Cl. 219-155.000.

Fritsch, Willi. Conical filter basket for a continuously operating centrifuge. 4,115,278, Cl. 210-488.000.

Friz, Walter, to Hay, Louis E. Traveling wave device with unific composite metal dielectric helix and method for forming. 4,115,721, Cl. 315-3.500.

Frohling, Hans-Joachim; and Rothe, Werner, to H. F. & Ph. F. Reemtsma. Folded cigarette box. 4,114,777, Cl. 229-44.0CB.

Fryberg, Mario: *See*—
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,115,121, Cl. 96-56.300.

FTS Systems, Inc.: *See*—
Fraser, Douglas S., 4,114,287, Cl. 34-92.000.

Fuhrhop, Ronald Elmer, to Union Carbide Corporation. Method and apparatus for producing a post-mixed, stabilized scarfing pre-heating flame. 4,115,154, Cl. 148-9.500.

Fuji Photo Film Co., Ltd.: *See*—
Adachi, Keiichi; Ikeda, Tadashi; and Tsujino, Nobuyuki, 4,115,122, Cl. 96-76.00R.
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.
Kita, Nobuyuki, 4,115,128, Cl. 96-91.00D.
Kondo, Toshihiro, 4,114,994, Cl. 352-139.000.
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Kubotera, Kikuo; Kashiwabara, Akira; and Sato, Kotaro, 4,115,118, Cl. 96-33.000.

Fujii, Hideo; Fujiki, Tokio; Uemura, Masaru; and Sakura, Masakazu, to Toyo Soda Manufacturing Co., Ltd. Apparatus for preparing multilaminated sheet. 4,115,181, Cl. 156-497.000.

Fujikawa, Kanichi: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,115,102, Cl. 71-94.000.

Fujikawa, Tetsuzo; and Misawa, Kichiji, to Kawasaki Jukogyo Kabushiki Kaisha. Accessory mounting means for internal combustion engines. 4,114,586, Cl. 123-195.00A.

Fujiki, Tokio: *See*—
Fujii, Hideo; Fujiki, Tokio; Uemura, Masaru; and Sakura, Masakazu, 4,115,181, Cl. 156-497.000.

Fujikura Cable Works, Ltd., The: *See*—
Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, 4,114,981, Cl. 350-96.330.

Fujimori, Nobuyoshi: *See*—
Hayashi, Yoshiaki; and Fujimori, Nobuyoshi, 4,115,825, Cl. 360-85.000.

Fujimoto, Isao; Aiba, Masaliiko; Yamamoto, Yoichi; and Makita, Tomoo, to Nippon Telegraph and Telephone Public Corporation;

and Sharp Kabushiki Kaisha. Interpolation in an ink jet system printer. 4,115,787, Cl. 346-75.000.

Fujimoto, Takeo; Torimaru, Yasuo; Ogawa, Shin-ichi; and Yasue, Shinya, to Sharp Kabushiki Kaisha. Complementary-MOS integrated semiconductor device. 4,115,796, Cl. 357-42.000.

Fujinami, Hiroshi: *See*—
Yamaguchi, Hiroaki; and Fujinami, Hiroshi, 4,115,764, Cl. 340-530.000.

Fujita, Takashi: *See*—
Higuchi, Iwao; and Fujita, Takashi, 4,115,676, Cl. 219-10.49R.

Fujita, Yutaka: *See*—
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.

Fujitsu Limited: *See*—
Chiba, Takashi, 4,115,855, Cl. 364-200.000.
Ito, Chiaki, 4,115,760, Cl. 340-146.30H.
Katoh, Tadayoshi; and Itaya, Eiji, 4,114,710, Cl. 178-67.000.
Nagano, Genzo; Nakamura, Hiroshi; and Sohma, Yukio, 4,115,851, Cl. 364-200.000.

Fujiwara, Sigekazu: *See*—
Mitarai, Akira; and Fujiwara, Sigekazu, 4,115,738, Cl. 329-105.000.

Fujiwara, Toshio: *See*—
Kogure, Yoichi; Minoura, Toshimi; and Fujiwara, Toshio, 4,115,848, Cl. 364-107.000.

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Fukui, Kiyozumi, to Teijin Seiki Company Limited. Drive controlling mechanism. 4,114,737, Cl. 192-3.00N.

Fukuoka, Shigetada: *See*—
Yamamoto, Hiroshi; and Fukuoka, Shigetada, 4,114,890, Cl. 273-237.000.

Fun Things, Inc.: *See*—
Csoka, Frank S., 4,114,892, Cl. 273-265.000.

Funsten, Stanard R.: *See*—
Webb, Daniel R.; Steinke, John R.; Berry, Robert W.; and Funsten, Stanard R., 4,114,698, Cl. 173-1.000.

Fur, Nick. Apparatus for the storage and retrieval of items. 4,114,767, Cl. 214-16.40A.

Furmaga, Walter V. Safety structure. 4,114,529, Cl. 100-53.000.

Furmanite International Limited: *See*—
Richardson, Arthur William, 4,114,654, Cl. 138-89.000.

Furnier- und Sperrholzwerk J. F. Werz Jr. KG Werzalit-Pressholzwerk Oberstenfeld: *See*—
Munk, Edmund, 4,115,490, Cl. 264-26.000.

Furusawa, Tomotaka: *See*—
Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, 4,115,369, Cl. 526-65.000.

Fuscone, Roy. Dart flights. 4,114,883, Cl. 273-106.50C.

Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, to Cime Bocuze. Process for the preparation of molybdenum based alloys by sintering. 4,115,113, Cl. 75-206.000.

Futamase, Tsuyoshi: *See*—
Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,114,498, Cl. 84-1.190.

G. H. Endress & Co.: *See*—
Magri, Antonio, 4,114,441, Cl. 73-290.00V.

Gabry, Frank F. Expandable door. 4,114,674, Cl. 160-222.000.

GAF Corporation: *See*—
Hort, Eugene V., 4,115,458, Cl. 568-847.000.
Kelly, Edward G., 4,114,346, Cl. 52-746.000.

Gager, Morgan E.: *See*—
Habib, David P.; and Gager, Morgan E., 4,114,926, Cl. 282-27.500.

Gagin, Anatoly Vasilievich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Gale, Glen Roy; and Meischen, Sandra Jan, to United States of America, America. 1,2-Diaminocyclohexane platinum (II) complexes having antineoplastic activity. 4,115,418, Cl. 260-429.00R.

Galimova, Guzal Abdulkhaevna: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Gall, Ludwig; and Fabian, Wolfgang, to BASF Aktiengesellschaft. Perylene-3,4,9,10-tetracarboxylic acid diimide pigment, its manufacture and its use. 4,115,386, Cl. 260-281.00P.

Gallien, Shelby W.: *See*—
Shelby, Thomas A.; and Gallien, Shelby W., 4,115,342, Cl. 260-33.40P.

Gallus, Julius P., to Union Oil Company of California. Method for cementing high temperature wells. 4,114,692, Cl. 166-293.000.

Gambill, Ulysses T.: *See*—
Kissell, Ronald E.; and Gambill, Ulysses T., 4,115,498, Cl. 264-119.000.

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Gancy, Alan B.; and Poncha, Rustom P., to Allied Chemical Corporation. Absorptive low bulk density product from sodium sesquicarbonate. 4,115,525, Cl. 423-425.000.

Gannaway, Edwin L., to Tecumseh Products Company. Valve arrangement for compressor. 4,115,044, Cl. 417-564.000.

Gant, Preston L.: *See*—
Fertl, Walter H.; and Gant, Preston L., 4,115,688, Cl. 250-253.000.

Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Alkyne compounds and method of use. 4,115,456, Cl. 260-613.00R.

Garden, Graham Miller; and Harwood, Richard James, to New Zealand Inventions Development Authority. Drive means and harvesting apparatus incorporating same. 4,114,463, Cl. 74-61.000.

Gardner, Jeffrey M., to Container Corporation of America. Interlocking cover and tray. 4,114,798, Cl. 229-43.000.

Gardner, Peter Alan Edward: *See*—
Commander, Robert Duncan; Gardner, Peter Alan Edward; and Taylor, John Richard, 4,115,823, Cl. 360-77.000.

Garlock Inc.: *See*—
Bainard, Dean R., 4,114,245, Cl. 29-156.40R.
Bainard, Dean R., 4,114,897, Cl. 277-1.000.
Bainard, Dean R.; and Wright, Roger W., 4,114,898, Cl. 277-9.000.

Garmonov, Izmail Vladimirovich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Garn, Lynn E.: *See*—
Balcerak, Raymond S.; and Garn, Lynn E., 4,115,692, Cl. 250-338.000.

Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy Corporation. Bis-aminoarylethane amide compounds. 4,115,450, Cl. 260-558.00A.

Garrett Corporation, The: *See*—
Saylor, B. Franklin, 4,114,808, Cl. 236-87.000.

Garrett, Michael Ernest: *See*—
Smith, Kenneth Cecil; and Garrett, Michael Ernest, 4,115,258, Cl. 210-15.000.

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Gasanova, Alevtina Anatolievna: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Gascoigne Gush & Dent (Agricultural) Limited: *See*—
Dode, Peter Francis; and Hawkins, Michael Francis, 4,114,565, Cl. 119-14.010.

Gaston County Dyeing Machine Company: *See*—
Turner, James Keith; and Sturkey, William Cleere, 4,114,407, Cl. 68-178.000.

Gatby, Sven-Olof. Combination tool. 4,114,216, Cl. 7-116.000.

Gay, Derek John, to Mattel, Inc. Toy helicopter. 4,114,309, Cl. 46-75.000.

Gee, Victor L. Gate lock and latch. 4,114,408, Cl. 70-128.000.

Geiger, Dana F.: *See*—
Brosh, Amnon; and Geiger, Dana F., 4,115,767, Cl. 340-347.0CC.

Geints, Dmitry Evgenievich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Gemini, Vincenzo: *See*—
DeFeo, Francesco; Gemini, Vincenzo; and Floridia, Luigi, 4,115,057, Cl. 8-54.000.

General Battery Corporation: *See*—
DiGiacomo, Hector L.; and Sacco, John A., 4,114,260, Cl. 29-623.100.

General Dynamics Corporation: *See*—
Bitson, Joseph W., 4,114,452, Cl. 73-504.000.

Crittenden, Jack H.; and Bitson, Joseph W., 4,114,451, Cl. 73-504.000.
General Electric Company: *See*—
Boldebuck, Edith M.; and Banucci, Eugene G., 4,115,341, Cl. 260-33.20R.
Bondi, Pasquale Columbo, 4,114,857, Cl. 251-324.000.
Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 4,115,674, Cl. 200-329.000.
Denny, Dann W., 4,114,681, Cl. 165-26.000.
Eff, Christian A., 4,114,523, Cl. 99-393.000.
Giaever, Ivar, 4,115,535, Cl. 424-1.000.
Guichard, Robert C., 4,115,701, Cl. 250-552.000.
Howell, Edward Keith, 4,115,829, Cl. 361-42.000.
Huizenga, Ronald G., 4,115,751, Cl. 337-323.000.
Jenis, Donald S.; Kuczkowski, Thomas A.; Mazer, Jack S.; and Westerkamp, Douglas F., 4,114,684, Cl. 165-82.000.
Kelman, Arnold Lloyd, 4,115,695, Cl. 250-445.00T.
Lange, Kai; Toefting, Verner; Wiesen, Ernest J.; and Lijewski, Robert R., 4,115,694, Cl. 250-363.00S.
Lawrence, George J., 4,114,974, Cl. 339-103.00C.
Mark, Victor; and Hoogebroom, Thomas J., 4,115,354, Cl. 260-45.70S.
Patenaude, Raymond Arthur, 4,114,511, Cl. 89-33.0CA.
Phipps, Donald Lee, Jr.; and Wambach, Allen Dale, 4,115,333, Cl. 260-22.00R.
Smashey, Russell W.; Frey, Elmer L.; Cash, George V.; and Irons, George S., 4,115,112, Cl. 75-171.000.
Truscott, John Compton, 4,115,696, Cl. 250-445.00T.
Vestergaard, Jorgen H., 4,115,358, Cl. 528-196.000.
Ward, William J., III, 4,115,514, Cl. 423-232.000.
General Motors Corporation: *See*—
Shellhause, Ronald L., 4,114,377, Cl. 60-589.000.
General Time Corporation: *See*—
Hart, Robert D.; and Mazzamauro, Robert, 4,115,769, Cl. 340-373.000.
Ingenito, Michael J.; and Hartnett, Harold J., 4,115,714, Cl. 310-49.00R.
Yagusic, George J.; and Boronosky, Richard A., 4,115,838, Cl. 361-388.000.
Genessi, Richard J. Lint interceptor. 4,115,485, Cl. 261-119.00R.
Geno Corporation: *See*—
Chandler, Roy L., 4,115,670, Cl. 200-5.00R.
Georg Fischer Aktiengesellschaft: *See*—
Pavlovsky, Rudolf; and Wuest, Heinz, 4,114,281, Cl. 33-180.00R.
Wernli, Max, 4,114,677, Cl. 164-168.000.
Gerow, Clare William, to Du Pont de Nemours, E. I., and Company. Antistatic vinylidene chloride coating composition, and film coated therewith. 4,115,334, Cl. 260-28.50D.
Gershberg, David N.; Lee, Alexander Y.; and D'Orto, Michael D., to E-Systems, Inc. Radiation enhancement device. 4,115,781, Cl. 343-768.000.
Gerwin, Reinhard, to J. Eberspacher. Burner construction and method for burning liquid and/or gaseous fuel. 4,115,050, Cl. 431-352.000.
Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH.: *See*—
Boddeker, Karl W.; and Hilgendorff, Walter, 4,115,274, Cl. 210-321.00R.
Giacoppo, Guglielmo; and Tres, Ercole, to Societa Italiana Telecomunicazioni Siemens S.p.A. Multiple circuit interrupter for telecommunication system. 4,115,665, Cl. 179-98.000.
Giaever, Ivar, to General Electric Company. Diagnostic method employing a mixture of normally separable protein-coated particles. 4,115,535, Cl. 424-1.000.
Gijsbers, Roelof, to C. van der Lely N.V. Apparatus for conninuting solids in liquids. 4,114,815, Cl. 241-45.000.
Gillette Company, The: *See*—
Buchholz, Alexis Emmanuel, 4,114,264, Cl. 30-34.100.
Gillette, Harold R.: *See*—
Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., 4,114,750, Cl. 400-279.000.
Gindler, E. Melvin, to Pierce Chemical Company. Method for bilirubin determination. 4,115,064, Cl. 23-230.00B.
Giraldi, PierNicola: *See*—
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.
Girling Limited: *See*—
Knight, Peter Charles, 4,114,733, Cl. 188-196.0BA.
Gladow, Dean E.; and Clifton, Kenneth C., to Didde-Glaser, Inc. Mechanism for effecting interlock of multiple sheet continuous business forms. 4,114,869, Cl. 270-37.000.
Glaenzer Spicer: *See*—
Orain, Michel A., 4,115,022, Cl. 403-359.000.
Glass, Carl R. Ornamental sunburst hub. 4,115,608, Cl. 428-65.000.
Glenn, Edwin E., Jr., to Mobil Oil Corporation. Method and system for acoustic noise logging. 4,114,721, Cl. 181-105.000.
Glover, Glen A., Jr.; and Cambron, Robert B., to Caterpillar Tractor Co. Piston valve pocket relief. 4,114,518, Cl. 92-208.000.
Go, Santos W., to Owens-Illinois, Inc. Linear copolyesters of isophthalic acid 4,4'-sulfonyldibenzoic acid, bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol. 4,115,363, Cl. 528-294.000.
Goeman, Friedrich, to W. R. Bonsal Company. Composition and method for producing glass reinforced cement products. 4,115,135, Cl. 106-99.000.
Goff, Raymond Charles, to Aston Electronic Developments Ltd. Data slicing apparatus and method. 4,115,811, Cl. 358-167.000.
Goko, Nobuaki: *See*—
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,532, Cl. 423-492.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,533, Cl. 423-492.000.
Goldberg, Eitan: *See*—
Goldberg, Moshe; and Goldberg, Eitan, 4,114,659, Cl. 141-26.000.
Goldberg, Moshe; and Goldberg, Eitan, to Goldberg, Eitan. Pipette filling and liquid dispensing device. 4,114,659, Cl. 141-26.000.
Goldenberg, Marvin M.: *See*—
Wright, George C.; and Goldenberg, Marvin M., 4,115,405, Cl. 260-345.200.
Wright, George C.; and Goldenberg, Marvin M., 4,115,407, Cl. 260-345.200.
Goldfarb, Adolph E.; and Benkoe, Erwin. Memory skill game. 4,114,877, Cl. 273-1.00R.
Golz, Hans-Joachim: *See*—
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, 4,114,649, Cl. 137-625.190.
Gomyo, Shiro: *See*—
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.
Gonser, Donald I., to Dentsply Research and Development Corporation. Electrosurgical device. 4,114,622, Cl. 128-303.140.
Gooch, Beverley R., to Ampex Corporation. Magnetic transducer for narrow track recording and playback. 4,115,827, Cl. 360-121.000.
Goodacre, John Purefoy; Potter, Colin; and Ball, Peter, to National Supply Company (U.K.) Limited. Articulated arms. 4,114,662, Cl. 141-387.000.
Goodman, David J. Direction finding antenna system. 4,115,780, Cl. 343-739.000.
Goodman, James M., to E.G. Sprinkler Corporation. Backup roll for thin walled pipe grooving device. 4,114,414, Cl. 72-105.000.
Goodyear Aerospace Corporation: *See*—
Salmen, Richard A.; and Reed, Clark G., 4,115,801, Cl. 358-93.000.
Gordon, Carroll G. Valve structure. 4,114,650, Cl. 137-625.630.
Gori & Zucchi S.p.A.: *See*—
Orlandini, Orlando Paladino, 4,114,398, Cl. 63-3.000.
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich. Method of growing epitaxial semiconductor films utilizing radiant heating. 4,115,163, Cl. 148-175.000.
Goto, Hiroshi: *See*—
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,115,739, Cl. 330-263.000.
Goto, Kuniaki; and Kodama, Kazumi, to Nippon Zeon Co. Ltd. Novel derivatives useful as additives for inhibiting the deterioration of degradable substances. 4,115,355, Cl. 260-45.95H.
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Exhaust gas recirculating control system. 4,114,576, Cl. 123-119.00A.
Goulay, Jean: *See*—
Lormeau, Jean-Claude; Goulay, Jean; and Vairel, Edmond, 4,115,551, Cl. 424-105.000.
Gould, Harry J.: *See*—
Han, Ching C.; and Gould, Harry J., 4,115,782, Cl. 343-779.000.
Gould Inc.: *See*—
Brown, Arling Dix, Jr.; and Reilly, Edward Justus, 4,115,763, Cl. 340-166.00R.
Zoltan, Steven I., 4,115,734, Cl. 324-151.00A.
Gournier, Andre: *See*—
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,114,907, Cl. 277-206.00R.
Governale, Bernard C., to Peachtree Doors, Inc. Bottom sweep and rail unit for foam-filled doors. 4,114,319, Cl. 49-488.000.
Graff, Hart F.: *See*—
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,114,563, Cl. 118-63.000.
Graff, John M.: *See*—
Stoltze, Leon; and Graff, John M., 4,115,611, Cl. 428-174.000.
Gragson, James T.; and Ballard, Joseph E., to Phillips Petroleum Company. Treated fabrics and process. 4,115,562, Cl. 264-234.000.
Graham, Blair M.; and Hamrick, Harry C., to Graham, Blair M. Airplane configuration designed for the simultaneous reduction of drag and sonic boom. 4,114,836, Cl. 244-1.00N.
Graham, Sandra I.: *See*—
Nyi, Kayson; and Graham, Sandra I., 4,115,232, Cl. 204-159.230.
Grandin, Friedrich-Hans; Fritsch, Werner; and Wengenrod, Gunter, to Mannesmann Aktiengesellschaft. Resistive heating of elongated stock. 4,115,685, Cl. 219-155.000.
Gransden, Raymond E., Jr.: *See*—
Kurfman, Virgil B.; and Gransden, Raymond E., Jr., 4,115,619, Cl. 428-336.000.
Grant, Louis R., Jr., to United States of America, Air Force. Preparation of fluorotrinitromethane. 4,115,459, Cl. 260-644.000.
Grass, Alfred. Door hinge. 4,114,237, Cl. 16-145.000.
Grasselli, Robert K.: *See*—
Bartek, Joseph P.; Dolhyj, Serge R.; Velenyi, Louis J.; and Grasselli, Robert K., 4,115,464, Cl. 260-668.00C.
Grasshoff, Hans Dieter, to Deutsche Texaco Aktiengesellschaft. Biodegradable grease composition. 4,115,282, Cl. 252-18.000.

Grather, Gunter: *See—*
Rabus, Friedrich; Wahl, Josef; and Grather, Gunter, 4,114,582, Cl. 123-148.00E.
Graversen, Niels Peter Grand, to Danfoss A/S. Thermostatically actuated regulator for a 4-lead air conditioning plant. 4,114,806, Cl. 236-1.00C.
Gravley, Wilton: *See—*
Patton, Bobbie J.; Sexton, James H.; Gravley, Wilton; and Foster, C. Mackay, Jr., 4,114,435, Cl. 73-151.500.
Gray, Lew T.: *See—*
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., 4,115,335, Cl. 260-28.5AS.
Greber, Gerd: *See—*
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,115,231, Cl. 204-159.220.
Green, Ethan Robert: *See—*
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, 4,115,816, Cl. 358-283.000.
Greenhalgh, Colin William; Carey, John Laurence; and Newton, David Francis, to Imperial Chemical Industries Limited. Benzodifuran dyestuffs. 4,115,404, Cl. 260-343.30R.
Greenspan, Harold Jack. Abrasive member. 4,114,322, Cl. 51-206.00R.
Greer, Kent R.: *See—*
Bennett, John Reginald; and Greer, Kent R., 4,115,269, Cl. 210-150.000.
Greeson, Thomas J. Table top assembly for vehicle bumper jack. 4,114,858, Cl. 254-1.000.
Gregg, Peter P.: *See—*
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,115,836, Cl. 361-382.000.
Gregorius, Klaus: *See—*
Janner, Karl; and Gregorius, Klaus, 4,115,078, Cl. 55-2.000.
Greier, Josef: *See—*
Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, 4,114,714, Cl. 180-54.00A.
Greinacher, Ekkehard; Reinhardt, Klaus; and Strnat, Karl, to TH. Goldschmidt AG. Method of increasing the coercive force of pulverized rare earth-cobalt alloys. 4,115,159, Cl. 148-105.000.
Greiner, Karl Walter. Expandable house trailer structure. 4,114,942, Cl. 296-23.00G.
Greive, Aloys, to Hamel GmbH Zwirnmaschinen. Thread-wetting arrangement for yarn-twisting apparatus. 4,114,357, Cl. 57-35.000.
Greulich, Bodo Arthur: *See—*
Kraus, Willibald; and Greulich, Bodo Arthur, 4,114,972, Cl. 339-65.000.
Grey, John Constantine, to Thorpenco (Sales & Service Ltd.). Couplings. 4,114,403, Cl. 64-15.00B.
Grieder, Charles K. Aerodynamically driven toy. 4,114,308, Cl. 46-53.000.
Griffith, Edward J., to Monsanto Company. Treatment of aqueous dispersions. 4,115,233, Cl. 204-180.00R.
Grill, Benjamin: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,114,647, Cl. 137-624.200.
Grimmer, Klaus Jurgen. Unbalanced vibrator for an oscillating conveyor or a vibrating screen. 4,114,462, Cl. 74-61.000.
Grimsley, Ernest E. Portable boring tool for ball valves. 4,114,483, Cl. 82-1.200.
Grinberg, Jan: *See—*
Bleha, William P., Jr.; and Grinberg, Jan, 4,114,991, Cl. 350-338.000.
Gritti, Sergio, to Montedison S.p.A. Liquid compositions based on polyglycolethers having a high boiling point. 4,115,291, Cl. 252-73.000.
Gropper, Hans: *See—*
Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, 4,115,638, Cl. 526-61.000.
Gross, Albert; and Schaefer, Roland, to Kulzer & Co. GmbH. Hydroxy group containing diesters of acrylic acids and their use in dental material. 4,115,346, Cl. 260-42.150.
Gross, Thomas A. O. Braking system for three phase motors. 4,115,727, Cl. 318-212.000.
Groves, Malcolm Duane, to Combustion Engineering, Inc. High density fuel storage racks. 4,115,700, Cl. 250-518.000.
Grubb, Donald G. Means for forming and splitting prestressed concrete elements. 4,115,049, Cl. 425-111.000.
Grumman Aerospace Corporation: *See—*
Deb, Satyendra Kumar, 4,115,631, Cl. 429-111.000.
Duzich, John J., 4,115,754, Cl. 340-27.00R.
Grunewalder, Werner, to Henkel Kommanditgesellschaft auf Aktien. Combination method for cleaning greatly soiled textiles. 4,115,061, Cl. 8-137.000.
Gruzintsev, Igor Andreevich: *See—*
Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Scherbakov, Vsevolod Sergeevich; and Gruzintsev, Igor Andreevich, 4,115,043, Cl. 417-559.000.
GTE Laboratories Incorporated: *See—*
Auborn, James J.; and Trickett, Elizabeth A., 4,115,526, Cl. 423-440.000.
Rhodes, William H., 4,115,134, Cl. 106-73.200.
GTE Sylvania Incorporated: *See—*
Bovio, Robert J.; and Mercaldi, Renaldo, 4,114,903, Cl. 277-81.00R.
Egan, William F., 4,115,745, Cl. 331-17.000.
Latassa, Frank M., 4,114,968, Cl. 316-1.000.
Rowe, Don H.; and Sasnett, Michael W., 4,115,828, Cl. 361-1.000.
Guerrero, Benjamin G.; Leistikow, Gerard K.; and Sindlinger, Norman E., to Mattel, Inc. Combination doll and accessory articles. 4,114,313, Cl. 46-264.000.
Guerry, Raymond Ellwood, to Procter & Gamble Company, The. High-shear process for preparing silicate-containing paste-form detergent compositions. 4,115,308, Cl. 252-135.000.
Guertin, Emile. Solar heating system. 4,114,593, Cl. 126-270.000.
Guichard, Robert C., to General Electric Company. Coaxial reflex photoelectric scanner. 4,115,701, Cl. 250-552.000.
Guillaume, Andre; and Sagi, Ferenc, to Rhone-Poulenc Industries. Homogeneous dispersions of diorganopolysiloxane compositions in mineral oils. 4,115,343, Cl. 260-33.6SB.
Guimbal, Jean, to Agence Nationale de Valorisation de la Recherche (ANVAR). High power and high speed linear motor. 4,115,712, Cl. 310-12.000.
Guinet, Yves Maurice; and Noirel, Yves Maurice, to Etablissement Public Dit Telediffusion de France; and L'Etat Francais, Represente par le Secretaire d'Etat aux Postes et Telecommunications. One way data transmission system. 4,115,662, Cl. 179-15.0BV.
Gulf & Western Manufacturing Company: *See—*
Byrne, James C.; and Talmage, Dennis D., 4,115,723, Cl. 315-84.000.
Gun, Dmitry Rudolfovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.
Gunjima, Tomoki: *See—*
Asawa, Tatsuro; and Gunjima, Tomoki, 4,115,240, Cl. 204-296.000.
Gupta, Pramod: *See—*
Henes, Gerhard; Muller, Hans Jurgen; Gupta, Pramod; and Zirner, Joachim, 4,115,373, Cl. 528-48.000.
Gupta, Rakesh Kumar; Jurkiewitsch, George; and Logan, Lawrence Joseph, to Hercules Incorporated. Conjugate filaments. 4,115,620, Cl. 428-374.000.
Gurkov, Konstantin Stepanovich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich, 4,114,700, Cl. 175-19.000.
Gustavsson, Rolf; and Hedvall, Per, to ASEA Aktiebolag. Magnetic separator. 4,115,262, Cl. 210-42.00S.
Gvozdev, Vladimir Nikolaevich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.
H. F. & Ph. F. Reemtsma: *See—*
Frohling, Hans-Joachim; and Rothe, Werner, 4,114,777, Cl. 229-44.0CB.
Haake, Robert, to Phone-mate, Inc. Tape drive system and one-way clutch mechanism. 4,114,834, Cl. 242-200.000.
Habermann, Helmut; Brunet, Maurice; and LeClere, Jacques, to Societe Europeenne de Propulsion. Radial displacement detector device for a magnetic bearing. 4,114,960, Cl. 308-10.000.
Habib, David P.; and Gager, Morgan E., to Trans World Technology Laboratories, Inc. Barrier coat for use in thermographic imaging assembly. 4,114,926, Cl. 282-27.500.
Habu, Nobuo: *See—*
Yanagihara, Hiromichi; and Habu, Nobuo, 4,114,568, Cl. 123-30.00D.
Hackenberg, Hubert: *See—*
Engelsmann, Dieter; Hackenberg, Hubert; and Zobel, Siegfried, 4,115,792, Cl. 354-213.000.
Hague International: *See—*
Bjerklie, John W., 4,115,051, Cl. 432-3.000.
Hakkinen, Seppo: *See—*
Paakkinen, Ilmari; Hakkinen, Seppo; and Matula, Jouni, 4,114,818, Cl. 241-244.000.
Halcon International, Inc.: *See—*
Brill, William F., 4,115,420, Cl. 260-429.00R.
Brill, William F., 4,115,421, Cl. 260-429.00R.
Naglieri, Anthony N.; and Rizkalla, Nabil, 4,115,419, Cl. 260-429.00R.
Rizkalla, Nabil, 4,115,444, Cl. 260-549.000.
Halcour, Kurt: *See—*
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,115,462, Cl. 260-667.000.
Hale, Peter: *See—*
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, 4,115,548, Cl. 424-70.000.
Hall, Eric R. D., to Schaefer Marine Products. Goose-neck fitting. 4,114,551, Cl. 114-98.000.
Hall, Ernest M., Jr., to Western Geophysical Co. of America. Electrical marine connector. 4,114,970, Cl. 339-49.00R.
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Substituted dimethyl dihydroxy benzene and cyclohexadiene compounds and uses thereof for augmenting or enhancing the taste and/or aroma of consumable materials including tobaccos, perfumes and perfumed articles. 4,115,431, Cl. 260-465.00F.

Hall, John B.: *See—*
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,115,406, Cl. 260-345.100.

Halmo, Terje Martin; and Skoglund, Liv, to Elopak A/S. Process for the production of pressed bodies from municipal refuse. 4,115,497, Cl. 264-115.000.

Hamel GmbH Zwirnmaschinen: *See—*
Greive, Aloys, 4,114,357, Cl. 57-35.000.

Hamill, Robert L.; Stark, William M.; and DeLong, Donald C., to Eli Lilly and Company. Factor A and B of antibiotic A-4696. 4,115,552, Cl. 424-118.000.

Hamilton, Gerald A., to Val-Trac Incorporated. Window trim assembly. 4,114,233, Cl. 16-95.00R.

Hamilton, Joel A.: *See—*
Mahaffy, Reid A.; and Hamilton, Joel A., 4,114,348, Cl. 53-433.000.

Hamilton, Lewis R.; and Sutton, Richard C., to Eastman Kodak Company. Method of immobilizing optical brighteners. 4,115,124, Cl. 96-82.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,115,542, Cl. 424-200.000.

Hammond, Robert Louis. Anchored golf tee. 4,114,878, Cl. 273-32.00A.

Hamon Sobelco S.A.: *See—*
Verlinden, Michel Francois Emile Jacques, 4,114,683, Cl. 165-78.000.

Hampton, Robert S., Jr.: *See—*
Spainhour, Phillip A.; Hampton, Robert S., Jr.; and Morrison, Leonard A., 4,114,283, Cl. 33-337.000.

Hamrick, Harry C.: *See—*
Graham, Blair M.; and Hamrick, Harry C., 4,114,836, Cl. 244-1.00N.

Han, Ching C.; and Gould, Harry J., to Ford Motor Company. Microwave antenna system. 4,115,782, Cl. 343-779.000.

Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, to Taisei Kensetsu Kabushiki Kaisha; and Teikoku Piston Ring Co., Ltd. Vertical centering method and jig for plating. 4,114,282, Cl. 33-180.00R.

Hannemann, Dennis M.; Huang, Kwang Ta; and Shiroma, Dallas M., to United States of America, Navy. Parametric energy coupled uninterruptible power supply. 4,115,704, Cl. 307-64.000.

Hanning, Robert. Method of making thermoplastic articles with porous cores. 4,115,491, Cl. 264-45.100.

Hans Kreutzenbeck GmbH: *See—*
Hummel, Herbert, 4,115,839, Cl. 361-393.000.

Hansen, Dan S., to F. L. Smidth & Co. Method of heat treating raw materials and rotary kiln plant therefor. 4,115,136, Cl. 106-100.000.

Hansen, Niels Junior; Ward, John Ambrose; Hintze, William; and Johnson, David Charles, to AMP Incorporated. Bimetal actuator. 4,115,750, Cl. 337-107.000.

Hara, Morihisa: *See—*
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.

Harayama, Akira: *See—*
Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, 4,114,282, Cl. 33-180.00R.

Hargis, Robert L., to Aluminum Company of America. Fused bath cell lid having corrosion protection means and method of using same. 4,115,214, Cl. 204-64.00R.

Harman Brother Limited: *See—*
Powell, Robert George, 4,114,238, Cl. 16-157.000.

Harpman, Webster B.; and Mahoney, Fred G., to Econo Fuel Systems, Inc. Hot fuel gas generator. 4,114,566, Cl. 123-25.00B.

Harrington, John J., to United States of America, Air Force. Deep penetrating forebody with tethered radar reflector. 4,115,775, Cl. 343-18.00B.

Harrington Manufacturing Company: *See—*
Jordan, Bertram Lee; and Mitchell, John Davis, 4,114,770, Cl. 214-130.00R.

Harris, Alan M.: *See—*
Horton, Michael L.; and Harris, Alan M., 4,114,352, Cl. 54-79.000.

Harris Data Communications, Inc.: *See—*
Rozell, James O., 4,115,852, Cl. 364-200.000.

Harris, Fred A., to Olin Corporation. Granulator. 4,114,817, Cl. 241-73.000.

Harris, James A. Mobile fluid treatment tank servicing apparatus. 4,114,661, Cl. 141-231.000.

Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased (by Bozeman, Arlene, executrix), to Texaco Inc. Solvent dewaxing process. 4,115,241, Cl. 208-33.000.

Harrison, Charles W.; Pitman, Herbert J.; and Sequeira, Avilino, to Texaco Inc. Solvent dewaxing process. 4,115,243, Cl. 208-33.000.

Harrison, Charles W.; and Watts, Leonard R., to Texaco Inc. Solvent dewaxing process. 4,115,245, Cl. 208-33.000.

Harrison, Charles W.: *See—*
Pitman, Herbert J.; Harrison, Charles W.; and Sequeira, Avilino, 4,115,244, Cl. 208-33.000.
Sequeira, Avilino; Pitman, Herbert J.; Harrison, Charles W.; and Quasny, Jerry E., 4,115,242, Cl. 208-33.000.

Harrison, James Berkeley, Jr.: *See—*
Catanese, Carmen Anthony; Harrison, James Berkeley, Jr.; and Lindburg, Norman Lee, 4,115,719, Cl. 313-105.00R.

Harrison, Robert S.: *See—*
Rogerson, Jerry B.; and Harrison, Robert S., 4,114,584, Cl. 123-179.00G.

Harrison, William E.: *See—*
Cruff, Carlton E.; and Harrison, William E., 4,114,285, Cl. 34-29.000.

Hart, Robert D.; and Mazzamauro, Robert, to General Time Corporation. Damping means for indicators. 4,115,769, Cl. 340-373.000.

Hartig, Ulrich: *See—*
Becker, Rolf; Borho, Klaus; Buechner, Oskar; Gropper, Hans; and Hartig, Ulrich, 4,115,638, Cl. 526-61.000.

Hartitz, Joachim Ernst, to B. F. Goodrich Company, The. Processing extruded thermoplastic polymer. 4,115,495, Cl. 264-90.000.

Hartke, David, to Xerox Corporation. Autonomous display processor. 4,115,765, Cl. 340-324.0AD.

Hartnett, Harold J.: *See—*
Ingenito, Michael J.; and Hartnett, Harold J., 4,115,714, Cl. 310-49.00R.

Hartupee, Richard B.: *See—*
Lista, Edwin L.; Hartupee, Richard B.; Manfred, Ralph K.; and O'Neil, Paul L., 4,115,166, Cl. 149-7.000.

Hartwell Corporation: *See—*
Poe, L. Richard, 4,114,509, Cl. 85-84.000.

Haruch, James: *See—*
Wohlert, Andrew M.; and Haruch, James, 4,114,305, Cl. 43-17.600.

Harvey, Gary Lee: *See—*
Dean, Charles Wallace; Cummings, Gary Eugene; and Harvey, Gary Lee, 4,114,340, Cl. 52-520.000.

Harvey Hubbell Incorporated: *See—*
Skrovanek, Ambroz K.; and Clark, Fred E., Jr., 4,115,668, Cl. 179-170.200.

Harwood, Richard James: *See—*
Garden, Graham Miller; and Harwood, Richard James, 4,114,463, Cl. 74-61.000.

Hase, Christian: *See—*
Krause, Horst-Jurgen; Hase, Christian; and Bloching, Helmut, 4,115,309, Cl. 252-186.000.

Hasegawa, Kinji: *See—*
Mitsuishi, Yukio; Shiozaki, Shigeru; and Hasegawa, Kinji, 4,115,617, Cl. 428-336.000.

Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, to Yoshida Kogyo K.K.; Toa Paint Co., Ltd.; and Shin-Etsu Chemical Co., Ltd., part interest to each. Process of coating aluminum materials molded by extrusion with polysiloxane coating. 4,115,607, Cl. 427-387.000.

Haselby, Robert Dale: *See—*
Patterson, Marvin LeRoy; Haselby, Robert Dale; and Kendig, Albert Prall, 4,115,726, Cl. 318-171.000.

Hashimoto, Masaru: *See—*
Kubo, Daijiro; and Hashimoto, Masaru, 4,115,748, Cl. 331-111.000.

Hashimoto, Yoitiro, to Hitachi, Ltd. Horizontal deflection circuit. 4,115,725, Cl. 315-403.000.

Hashimoto, Yoshitoshi; Kondo, Takajiro; and Asamoto, Toshitaka, to Hitachi Metals, Ltd. Full rotation type paper web cutting device. 4,114,491, Cl. 83-341.000.

Hashizume, Kyosuke: *See—*
Shimizu, Junichi; and Hashizume, Kyosuke, 4,115,147, Cl. 127-54.000.

Hasuo, Masayoshi: *See—*
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,532, Cl. 423-492.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,533, Cl. 423-492.000.

Hattori, Tadashi; Nakase, Takamichi; and Kohama, Tokio, to Nippon Soken, Inc. Air-to-fuel ratio control system. 4,114,578, Cl. 123-124.00R.

Hattori, Tatsuo: *See—*
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,115,436, Cl. 260-505.00N.

Hauni-Werke Korber & Co. Kg.: *See—*
Barbe, Karl-Heinz, 4,115,085, Cl. 55-193.000.

Hauser, Ivo, to Societe d'Assistance Technique pour Produits Nestle, S.A. Device for measuring the adhesion forces in a closure seal for a container and a method of operating this device. 4,114,434, Cl. 73-150.00R.

Haverstock, Charles B. Skin closure means. 4,114,624, Cl. 128-335.000.

Havinga, Reginoldus; and Swaters, Pieter Dirk, to Akzo NV. Radiation acid curable resin compositions and process for curing them. 4,115,224, Cl. 204-159.180.

Hawkins, Michael Francis: *See—*
Dode, Peter Francis; and Hawkins, Michael Francis, 4,114,565, Cl. 119-14.010.

Hawkins, Roland L. Texturing finish for synthetic filaments. 4,115,621, Cl. 428-395.000.

Hay, Louis E.: *See—*
Friz, Walter, 4,115,721, Cl. 315-3.500.

Hay, William Dunning: *See—*
Weinstock, Jacques; Lieber, Derek; and Hay, William Dunning, 4,115,690, Cl. 250-308.000.

Hayashi, Tooru: *See—*
Mizuta, Toshinobu; and Hayashi, Tooru, 4,115,699, Cl. 250-461.00B.

Hayashi, Yoshiaki; and Fujimori, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Tape loading apparatus in a magnetic recording and reproducing apparatus. 4,115,825, Cl. 360-85.000.

Hayashi, Yoshimasa: *See—*
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,114,643, Cl. 137-495.000.

Hayden, Howard Wayne: *See*—
Wadsworth, Milton E.; Miller, Jan D.; Herbst, John A.; Kolbe, John L.; and Hayden, Howard Wayne, 4,115,221, Cl. 204-108.000.

Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Process for hydrogenating a coke-forming hydrocarbon distillate. 4,115,255, Cl. 208-143.000.

Hazan, Isidor, to Du Pont de Nemours, E. I., and Company. Cathodic electrodeposition of paints. 4,115,227, Cl. 204-181.00C.

Hazemeijer B. V.: *See*—
Lipperts, Joseph H. F. G., 4,115,672, Cl. 200-144.00B.

Hearsey, Colin John, to Quimco GmbH. Process for the preparation of trisubstituted ureas. 4,115,445, Cl. 260-553.00A.

Heasman, Edward E., to Imoco-Gateway Corporation. Concrete reinforcement splice with location tab. 4,114,344, Cl. 52-741.000.

Heaton, Michael H. Cargo handling device. 4,114,941, Cl. 294-86.00R.

Hechler, Valentine, IV. Method of monitoring ratio of flowing mixture. 4,114,635, Cl. 137-3.000.

Hedaya, Eddie: *See*—
Eisenhardt, William Anthony, Jr.; Hedaya, Eddie; and Theodoropulos, Spyros, 4,115,539, Cl. 424-1.000.

Hedlund, Richard C. Device for preventing ice fishing holes from freezing closed. 4,114,304, Cl. 43-4.000.

Hedstrom, Jerry W., to Xerox Corporation. End-of-ribbon sensor device. 4,115,013, Cl. 400-249.000.

Hedvall, Per: *See*—
Gustavsson, Rolf; and Hedvall, Per, 4,115,262, Cl. 210-42.00S.

Heilman Enterprises, Inc.: *See*—
Ansbaugh, Donald I.; and Heilman, Glenn A., 4,114,353, Cl. 56-13.300.

Heilman, Glenn A.: *See*—
Ansbaugh, Donald I.; and Heilman, Glenn A., 4,114,353, Cl. 56-13.300.

Heimbrock, Henry H., to Van Products, a Division of Standex International Corporation. Cluster assembly and block therefor. 4,114,971, Cl. 339-59.00R.

Heitz, Roger M.; and Hill, Franklin, to United States of America, Air Force. Self-sealing fuel line assembly. 4,115,616, Cl. 428-310.000.

Heldt, Earl R., to Hewlett-Packard Company. Fiber optic connector. 4,114,979, Cl. 350-96.210.

Heller, Harold: *See*—
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 4,115,261, Cl. 210-40.000.

Hendry, David V. Toy vehicle. 4,114,312, Cl. 46-223.000.

Henes, Gerhard; Muller, Hans Jurgen; Gupta, Pramod; and Zirner, Joachim, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates containing isocyanurate groups. 4,115,373, Cl. 528-48.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Dieckelmann, Gerhard; Jeromin, Lutz; and Tollkotter, Gunther, 4,115,411, Cl. 260-348.260.
Grunewalder, Werner, 4,115,061, Cl. 8-137.000.
Krause, Horst-Jurgen; Hase, Christian; and Bloching, Helmut, 4,115,309, Cl. 252-186.000.
Weber, Rudolf; Pochandke, Winfried; and Schwadtke, Karl, 4,114,284, Cl. 34-12.000.

Hennen, Hans: *See*—
Opitz, Wolfgang; and Hennen, Hans, 4,115,531, Cl. 423-488.000.

Hennessy Products, Incorporated: *See*—
Brindle, Dale L., 4,114,318, Cl. 49-215.000.

Henningsen Foods Inc.: *See*—
Bergquist, Dwight H.; Cunningham, Franklin E.; and Eggleston, Robert M., 4,115,592, Cl. 426-32.000.

Henrich, Victor E.; and Fan, John C. C., to Massachusetts Institute of Technology. Method of making secondary-electron emitters. 4,115,228, Cl. 204-192.0EC.

Henry, Dick Peter, to University of Queensland, The. Process for producing feed protein. 4,115,593, Cl. 426-53.000.

Herbert, Donald G.: *See*—
Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., 4,114,750, Cl. 400-279.000.

Herbez, Francois. Camping tent for motorcycles and cyclists. 4,114,633, Cl. 135-1.00A.

Herbst, John A.: *See*—
Wadsworth, Milton E.; Miller, Jan D.; Herbst, John A.; Kolbe, John L.; and Hayden, Howard Wayne, 4,115,221, Cl. 204-108.000.

Hercules Incorporated: *See*—
Bukowick, Peter Anthony, 4,115,093, Cl. 71-88.000.
Gupta, Rakesh Kumar; Jurkiewitsch, George; and Logan, Lawrence Joseph, 4,115,620, Cl. 428-374.000.
Putney, Richard Knight, 4,115,377, Cl. 260-151.000.
Restaino, Alfred J., 4,115,339, Cl. 260-29.6HN.

Hergeth, Friedrich: *See*—
Hums, Dieter; Hergeth, Friedrich; and Wetzig, Werner, 4,115,140, Cl. 106-120.000.

Hermanson, Terry, to Mr. Christmas Incorporated. Disposable rain and weather protector. 4,114,634, Cl. 135-19.500.

Hermes, Julius, to Martin Processing, Inc. Process for the rapid, continuous and waterless dyeing and texturizing and heat-setting of textile and plastic materials. 4,115,054, Cl. 8-17.000.

Hertel, Roger C., to Buckbee-Mears Company. Echo sounding device with cathode ray tube display. 4,115,752, Cl. 340-3.00C.

Hess, Richard William, to Du Pont de Nemours, E. I., and Company. Pigmentary bright primrose yellow monoclinic bismuth vanadate and processes for the preparation thereof. 4,115,142, Cl. 106-288.00B.

Heuckroth, Carl C. Bulk wire storage and transport system. 4,114,771, Cl. 214-384.000.

Hewlett-Packard Company: *See*—
Heldt, Earl R., 4,114,979, Cl. 350-96.210.
Patterson, Marvin LeRoy; Haselby, Robert Dale; and Kendig, Albert Prall, 4,115,726, Cl. 318-171.000.

Heyer, Gunter: *See*—
Bartels, Gunter; Immenroth, Horst; and Heyer, Gunter, 4,115,220, Cl. 204-105.00R.

Hi-Speed Checkweigher Co., Inc.: *See*—
Del Rosso, Victor, 4,114,707, Cl. 177-145.000.

Hickey, Christopher Daniel Dowling. Containers having fluid-tight sealing means. 4,114,668, Cl. 150-0.500.

Hickman, Mark R.: *See*—
Naseck, Melvin L.; and Hickman, Mark R., 4,114,807, Cl. 236-1.00E.

Hicks, Albert Edward. Oil cooler tester. 4,114,425, Cl. 73-40.000.

Higgins, Thomas Engel; Ross, Camilla Brems; and Snella, Henry John, to Union Carbide Corporation. Extrudable collagen casing and method of preparation. 4,115,594, Cl. 426-140.000.

Higuchi, Iwao; and Fujita, Takashi, to Tokyo Shibaura Electric Co., Ltd. Induction heating apparatus. 4,115,676, Cl. 219-10.49R.

Hiiro, Takeshi; Sakurai, Hideki; and Kondo, Fumihiko, to Kawaken Fine Chemicals Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Method for the preparation of dialkylchlorosilanes. 4,115,426, Cl. 260-448.20E.

Hijikata, Sotaro: *See*—
Iwasaki, Kenji; and Hijikata, Sotaro, 4,115,717, Cl. 313-59.000.

Hildebrandt, Juergen J.: *See*—
Schubert, Klaus-Peter; Keller, Hartmut; and Hildebrandt, Juergen J., 4,114,464, Cl. 74-89.140.

Hildebrandt, William J.; and Rathbun, Richard H., to Stanley Works, The. Shears with improved latch for handles. 4,114,268, Cl. 30-262.000.

Hile, James L.: *See*—
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,114,951, Cl. 299-22.000.

Hilgendorff, Walter: *See*—
Boddeker, Karl W.; and Hilgendorff, Walter, 4,115,274, Cl. 210-321.00R.

Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., to SmithKline Corporation. Method for preparing auranofin. 4,115,642, Cl. 536-121.000.

Hill, Franklin: *See*—
Heitz, Roger M.; and Hill, Franklin, 4,115,616, Cl. 428-310.000.

Hill, Walter W.: *See*—
Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., 4,115,215, Cl. 204-67.000.

Hilliard, John R., to Dow Corning Corporation. Self adhering room temperature vulcanizable silicone elastomers. 4,115,356, Cl. 528-18.000.

Hilti Aktiengesellschaft: *See*—
Bisping, Heinz, 4,114,241, Cl. 24-81.0CC.

Hilty, Ronald L.: *See*—
Budlane, Stanley J.; Denny, Dann W.; and Hilty, Ronald L., 4,115,674, Cl. 200-329.000.

Him, James H.: *See*—
Dey, Arabinda N.; and Him, James H., 4,115,629, Cl. 429-56.000.

Hingarh, Hemraj K.; and Crippen, Richard E., to Fairchild Camera and Instrument Corporation. Integrated injection logic with heavily doped injector base self-aligned with injector emitter and collector. 4,115,797, Cl. 357-46.000.

Hintze, Anton E. Wind powered cylinder. 4,115,028, Cl. 415-2.000.

Hintze, William: *See*—
Hansen, Niels Junior; Ward, John Ambrose; Hintze, William; and Johnson, David Charles, 4,115,750, Cl. 337-107.000.

Hirai, Koji: *See*—
Kikuga, Toyoji; and Hirai, Koji, 4,115,327, Cl. 260-17.200.

Hirakawa, Koichi: *See*—
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.

Hirato, Mizuho: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.

Hird, David L.: *See*—
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,114,951, Cl. 299-22.000.

Hirota, Yutaka: *See*—
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,115,739, Cl. 330-263.000.

Hirsbrunner, Hans G.: *See*—
Santala, Teuvo J.; and Hirsbrunner, Hans G., 4,115,325, Cl. 252-514.000.

Hirsh, Ivan Yehudi: *See*—
Labbe, Francis Auguste Maurice; and Hirsh, Ivan Yehudi, 4,114,631, Cl. 131-84.00C.

Hitachi Heating Appliances Co., Ltd.: *See*—
Tachikawa, Hajime; and Satoh, Kenji, 4,115,678, Cl. 219-10.55B.

Hitachi, Ltd.: *See*—
Akatsu, Mitsuharu, 4,115,812, Cl. 358-174.000.
Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,115,762, Cl. 340-146.30H.
Hashimoto, Yoitiro, 4,115,725, Cl. 315-403.000.

Kosaka, Kimito; Umehara, Kunio; and Maruyama, Takeshi, 4,115,814, Cl. 358-243.000.
Miura, Yoshio; Kobayashi, Kazuhiro; and Yusa, Koue, 4,114,432, Cl. 72-135.000.
Mori, Yasunori, 4,114,573, Cl. 123-117.00D.
Ogasawala, Nobuhiko; Odazima, Mituo; and Watanabe, Yasuaki, 4,115,716, Cl. 310-153.000.
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.
Takahashi, Reijiro; Musoh, Masanori; and Ito, Tosikazu, 4,114,397, Cl. 62-516.000.
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, 4,115,761, Cl. 340-146.3AC.

Hitachi Metals, Ltd.: *See*—
Hashimoto, Yoshitoshi; Kondo, Takajiro; and Asamoto, Toshitaka, 4,114,491, Cl. 83-341.000.

Hitzrot, Henry W., Jr., to Bethlehem Steel Corporation. Abrasive material suitable for manually blast cleaning ferrous metals prior to painting. 4,115,076, Cl. 51-295.000.

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having a coupler effect. 4,114,497, Cl. 84-1.170.

Hochman, Arthur, to Art-Phyl Creations. Composite units for displaying merchandise. 4,114,763, Cl. 211-57.100.

Hochstein, Alfred. Inflatable structure. 4,114,325, Cl. 52-2.000.

Hodge, Joel W. Newspaper support for a newspaper delivery tube. 4,114,800, Cl. 232-1.00C.

Hodges, Paul: *See*—
Eggenberger, John S.; and Hodges, Paul, 4,115,768, Cl. 340-347.0DD.

Hoechst Aktiengesellschaft: *See*—
Opitz, Wolfgang; and Hennen, Hans, 4,115,531, Cl. 423-488.000.
Schladetsch, Hans Jakob; and Schroth, Gunther, 4,115,380, Cl. 260-186.000.
Skaletz, Detlev Herbert, 4,115,216, Cl. 204-73.00R.
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,115,522, Cl. 423-322.000.
Weber, Rolf-Ortwin; Soder, Alfons; and Boksay, Istvan, 4,115,569, Cl. 424-250.000.

Hoehn, Hans; and Schulze, Ernst, to E. R. Squibb & Sons, Inc. Amino derivatives of 6-phenylpyrazolo[3,4-b]pyridines. 4,115,394, Cl. 260-296.00H.

Hofferber, Henry E.; and Parker, Robert H., to Sperry Rand Corporation. Acceleration limited preselect altitude capture and control. 4,114,842, Cl. 244-180.000.

Hoffmann-La Roche Inc.: *See*—
Chadha, Naresh Kumar; Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,115,452, Cl. 260-586.00R.
Fischer, Ulf; and Wyss, Pierre-Charles, 4,115,641, Cl. 536-23.000.
Manchand, Percy, 4,115,650, Cl. 544-324.000.
Scannell, James Parnell; and Stempel, Arthur, 4,115,105, Cl. 71-113.000.
Valentine, Donald Herman, Jr., 4,115,417, Cl. 260-413.000.

Hoffmeister, Jurgen; and Saupe, Martin, to Kaltenbach & Voigt GmbH & Co. Medical treatment chair. 4,114,946, Cl. 297-191.000.

Hogan, Clarence Vaughn: *See*—
Selvin, Gerald Joseph; Oliver, Leland Wayne; Yamamoto, Stephen Kazuo; and Hogan, Clarence Vaughn, 4,114,976, Cl. 339-217.00S.

Hogan, Robert Benson: *See*—
Muhlfelder, Ludwig; and Hogan, Robert Benson, 4,114,841, Cl. 244-166.000.

Hogenson, Lavernon S. Lockable attachment means for luggage. 4,114,234, Cl. 16-114.00R.

Hohmann, Walter; and Kuhnel, Werner, to Bayer Aktiengesellschaft. Process for dyeing textiles. 4,115,412, Cl. 260-380.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Kato, Hideo; Koshinaka, Eiichi; Kurata, Sakae; and Uesaka, Ikuo, 4,115,392, Cl. 260-295.50R.

Holbrook, James E. F. Vehicle hitch device. 4,114,922, Cl. 280-512.000.

Holladay, Jimmie L.; and Scott, Ray A., to Coats Company, Inc., The. Tire changing apparatus. 4,114,672, Cl. 157-1.240.

Holson Co., The: *See*—
Holson, Sheldon, 4,114,300, Cl. 40-152.000.

Holson, Sheldon, to Holson Co., The. Photo album cover with framed inserts. 4,114,300, Cl. 40-152.000.

Holt, William H., to Carborundum Company, The. Rotary drum screen. 4,115,271, Cl. 210-247.000.

Honeywell Inc.: *See*—
Alamprese, Leo, 4,114,850, Cl. 251-86.000.
Nelson, Marvin D., 4,114,445, Cl. 73-360.000.

Honeywell Information Systems Inc.: *See*—
Besenfelder, Edward Roald, 4,115,759, Cl. 340-146.10F.

Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, to Sony Corporation. Multi-band tuner. 4,115,737, Cl. 325-459.000.

Honma, Chuichi: *See*—
Iguchi, Yoshio; Honma, Chuichi; Itoh, Takesi; and Hosokawa, Kazutaka, 4,114,427, Cl. 73-63.000.

Honma, Miyuki: *See*—
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, 4,115,538, Cl. 424-1.000.

Honshu Seishi Kabushiki Kaisha: *See*—
Iguchi, Yoshio; Honma, Chuichi; Itoh, Takesi; and Hosokawa, Kazutaka, 4,114,427, Cl. 73-63.000.

Hood & Co., Inc.: *See*—
Izbicki, Anthony J., 4,115,624, Cl. 428-617.000.

Hoogebroom, Thomas J.: *See*—
Mark, Victor; and Hoogebroom, Thomas J., 4,115,354, Cl. 260-45.70S.

Hooker, Derrell C., to Aspheric Associates, Ltd. Lathe for generating spherical or aspherical surfaces on workpieces, method for generating aspherical surfaces on workpieces and workpiece having aspherical surface. 4,114,486, Cl. 82-12.000.

Hoopes, Howard Sherman; McClenahan, Robert William; Walsh, Thomas Joseph; and Zecca, James William, to Leeds & Northrup Company. Open circuit detector for multipoint recorder. 4,115,785, Cl. 346-34.000.

Hori, Sumisaburo: *See*—
Morimoto, Toshiki; and Hori, Sumisaburo, 4,114,351, Cl. 53-157.000.

Hornby, William Edward; and Morris, David Lindsey, to National Research Development Corporation. Support matrix for carrying biologically active materials and process for the preparation thereof. 4,115,305, Cl. 260-6.000.

Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, to Daimler-Benz Aktiengesellschaft. Installation for vibration damping in drive connection of motor vehicles. 4,114,472, Cl. 74-574.000.

Hornle, Reinhold: *See*—
Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, 4,115,379, Cl. 260-163.000.

Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and by De Haan, Friedrich Jacobus, administrator, to U.S. Philips Corporation. Washing machine. 4,114,406, Cl. 68-24.000.

Hort, Eugene V., to GAF Corporation. Mixed polyhalogenated-1,4-butanediols. 4,115,458, Cl. 568-847.000.

Horton, Michael L.; and Harris, Alan M., to United States of America, Air Force. Protective jacket for chronically instrumented dogs. 4,114,352, Cl. 54-79.000.

Horton, Steven A., to Anaconda Company, The. Printed circuit board with fluorocarbon coated inductor. 4,115,840, Cl. 361-400.000.

Hoshi, Juro; and Watanabe, Makoto, to Nippon Gakki Seizo Kabushiki Kaisha. Rotation control system. 4,114,830, Cl. 242-191.000.

Hosokawa, Kazutaka: *See*—
Iguchi, Yoshio; Honma, Chuichi; Itoh, Takesi; and Hosokawa, Kazutaka, 4,114,427, Cl. 73-63.000.

Hosokawa, Takashi: *See*—
Nakajima, Hiroyuki; and Hosokawa, Takashi, 4,114,648, Cl. 137-625.500.

Hostein, Claude: *See*—
Labeye-Voisin, Gerard Francois; and Hostein, Claude, 4,115,856, Cl. 364-200.000.

Houdaille Industries, Inc.: *See*—
Kamman, Gordon W., 4,114,246, Cl. 29-451.000.
Kaufman, Menachen, 4,115,858, Cl. 364-474.000.

Houdeshell, Donald D. Multiple use adapters for pliers. 4,114,482, Cl. 81-421.000.

Hough, Robert J.; and Bacon, John E., to Boise Cascade Corporation. Compartmented composite container including a snap-fit separator member. 4,114,784, Cl. 220-408.000.

Hounsfield, Godfrey Newbold; and Williams, Anthony Michael, to EMI Limited. X-ray tube cooling arrangement. 4,115,697, Cl. 250-445.00T.

Hounsfield, Godfrey Newbold, to EMI Limited. Radiography. 4,115,698, Cl. 250-445.00T.

Houston, George B.; and Simonsen, Roger H. Apparatus for performing auxiliary management functions in an associative memory device. 4,115,850, Cl. 364-200.000.

Howa, Scott P., to Vibrabrush, Inc. Vibratory dental tool. 4,114,271, Cl. 32-2.000.

Howe, Robert K.: *See*—
Franz, John E.; and Howe, Robert K., 4,115,095, Cl. 71-90.000.

Howell, Edward Keith, to General Electric Company. Overcurrent and ground fault responsive trip unit for circuit breakers. 4,115,829, Cl. 361-42.000.

Hoyt, Edwin D.: *See*—
Williams, David E.; and Hoyt, Edwin D., 4,115,686, Cl. 219-523.000.

Hruza, Denis E., Sr.: *See*—
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,115,406, Cl. 260-345.100.

Hsu, Sheau-Po, to EIC International Corporation. Multi-purpose stapler. 4,114,793, Cl. 227-63.000.

Huang, Kwang Ta: *See*—
Hannemann, Dennis M.; Huang, Kwang Ta; and Shiroma, Dallas M., 4,115,704, Cl. 307-64.000.

Huch, Albert; and Lubbers, Dietrich Werner, to L. Eschweiler & Co. Process and arrangement for determining the perfusion factor of a gas in a sample. 4,114,602, Cl. 128-2.00E.

Huchette, Michel: *See*—
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.

Huddleston, Paul W., to Wean United, Inc. Broken wire switch apparatus. 4,114,413, Cl. 72-5.000.

Hughes Aircraft Company: *See*—
Bleha, William P., Jr.; and Grinberg, Jan, 4,114,991, Cl. 350-338.000.
Hughes, James K., to Phillips Petroleum Company. Polymers and rotationally molding same. 4,115,508, Cl. 264-310.000.
Huizenga, Ronald G., to General Electric Company. Thermostat and method of operating such. 4,115,751, Cl. 337-323.000.
Hulin, Martin J.: *See*—
Malish, Terrance J.; and Hulin, Martin J., 4,114,225, Cl. 15-230.170.
Hultman, David P.; and Bergsbaken, Jack L., to Kimberly-Clark Corporation. Anti-static compositions comprising a copolymer or perfluoroalkyl acrylate and polyoxyalkylene acrylate, wetting agent, and a salt selected from the group consisting of potassium acetate and lithium chloride in aqueous medium. 4,115,605, Cl. 427-377.000.
Hummel, Herbert, to Hans Kreutzenbeck GmbH. Self-supporting modular switchboard panel. 4,115,839, Cl. 361-393.000.
Humphreys, Wesley G.; and Camillo, Edward. Thermal damper assembly. 4,114,805, Cl. 236-1.00G.
Hums, Dieter; Hergeth, Friedrich; and Wetzig, Werner, to Intong AB. Lime silicic acid mixtures and methods of making building materials therefrom. 4,115,140, Cl. 106-120.000.
Hunter Douglas International N.V.: *See*—
de Wit, Hendrik; and Frentzel, Kurt Heinz, 4,114,673, Cl. 160-166.00A.
Huppi, Xaver Johann, to Elex A.G. Electrode hanger. 4,115,083, Cl. 55-148.000.
Hurley, James E.: *See*—
Berlik, Lee; and Hurley, James E., 4,114,589, Cl. 126-21.00R.
Hurni, William M.: *See*—
McAleer, William J.; and Hurni, William M., 4,115,010, Cl. 356-201.000.
Hussey, Charles L.: *See*—
Nardi, John C.; Hussey, Charles L.; King, Lowell A.; and Carpio, Ronald A., 4,115,390, Cl. 260-290.0HL.
Hutchings, Thomas J.; and Sanders, Virgil E., to Litton Systems, Inc. Counterbalanced oscillating ring laser gyro. 4,115,004, Cl. 356-106.0LR.
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., to Burroughs Corporation. Cooling system for dual-in-line packages. 4,115,836, Cl. 361-382.000.
Hutson, Donald G. Method of monitoring diet. 4,114,422, Cl. 73-23.100.
Hycel, Inc.: *See*—
Vick, Howard Andrew; and Johnson, Donald B., 4,115,864, Cl. 364-550.000.
Hydra Corporation: *See*—
Baeck, Henry S.; Bennett, William C.; Condon, David C.; Gillette, Harold R.; and Herbert, Donald G., 4,114,750, Cl. 400-279.000.
Hydro-Quebec: *See*—
Morcos, Ikram, 4,115,322, Cl. 252-447.000.
Hydrocarbon Research, Inc.: *See*—
Lehman, Leon M.; and Lambert, Glen I., 4,115,247, Cl. 208-62.000.
Ichikawa, Kiyoshi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,114,497, Cl. 84-1.170.
Ichikoh Industries, Limited: *See*—
Enomoto, Masao, 4,114,988, Cl. 350-289.000.
Ichimura, Takeo: *See*—
Ishibashi, Kazufumi; and Ichimura, Takeo, 4,115,131, Cl. 106-47.00Q.
ICI Australia Limited: *See*—
Bolto, Brian Alfred; and Eppinger, Kurt Hermann, 4,115,297, Cl. 521-32.000.
Iguchi, Yoshio; Honma, Chuichi; Itoh, Takesi; and Hosokawa, Kazutaka, to Honshu Seishi Kabushiki Kaisha. Apparatus for accurately measuring the freeness of paper stock flowing in a feed pipe. 4,114,427, Cl. 73-63.000.
Iho, Katsuhiko: *See*—
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.
Iijima, Tetsuya, to Nissan Motor Company, Limited. Control system for an automatic transmission including switch with lost motion actuator. 4,115,671, Cl. 200-61.910.
Iizuka, Hisakazu: *See*—
Masuoka, Fujio; and Iizuka, Hisakazu, 4,115,795, Cl. 357-24.000.
Iizuka, Tomio: *See*—
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.
Ikeda, Sadahiro: *See*—
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, 4,115,761, Cl. 340-146.3AC.
Ikeda, Tadashi: *See*—
Adachi, Keiichi; Ikeda, Tadashi; and Tsujino, Nobuyuki, 4,115,122, Cl. 96-76.00R.
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, to Fuji Photo Film Co., Ltd. Processing-free type lithographic printing plate material. 4,115,127, Cl. 96-85.000.
Ikeura, Kenji, to Nissan Motor Company, Limited. Internal combustion engine with air-fuel ratio control device. 4,114,372, Cl. 60-276.000.
Illinois Nuclear Electronics, Inc.: *See*—
McGrath, Neal, 4,115,693, Cl. 250-363.00S.
Illmann, Joachim: *See*—
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, 4,114,649, Cl. 137-625.190.
Imamura, Yoichi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,114,363, Cl. 58-23.00R.
Imax Entertainment Limited: *See*—
Shaw, William C., 4,114,996, Cl. 352-184.000.
Imler, Carl E. Water closet flush valve. 4,114,208, Cl. 4-366.000.
Immenroth, Horst: *See*—
Bartels, Gunter; Immenroth, Horst; and Heyer, Gunter, 4,115,220, Cl. 204-105.00R.
Imoco-Gateway Corporation: *See*—
Heasman, Edward E., 4,114,344, Cl. 52-741.000.
Imperial Chemical Industries Limited: *See*—
Bowler, Jean; and Robinson, Graham Ernest, 4,115,580, Cl. 424-278.000.
Greenhalgh, Colin William; Carey, John Laurence; and Newton, David Francis, 4,115,404, Cl. 260-343.30R.
Kennedy-Skipton, Henry Kinny, 4,114,384, Cl. 405-260.000.
Lafeber, Andre, 4,114,820, Cl. 242-18.00A.
Large, Michael Stewart; and Smith, Leslie Harold, 4,115,409, Cl. 260-347.300.
In Situ Technology Inc.: *See*—
Terry, Ruel C., 4,114,688, Cl. 166-246.000.
Inaba, Masakazu: *See*—
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,115,613, Cl. 428-207.000.
Inagaki, Mitsuo; Sasaya, Hideaki; and Kurahashi, Takashi, to Nippon Soken, Inc. Electric motor or generator including centrifugal cooling fan. 4,115,030, Cl. 416-93.00R.
Inata, Hiroo; and Kawase, Shoji, to Teijin Limited. Process for preparing polyesters. 4,115,362, Cl. 528-190.000.
Industrie Pirelli S.p.A.: *See*—
Maiocchi, Luigi; and Silva, Luigi, 4,114,671, Cl. 152-209.00R.
Previati, Augusto, 4,115,510, Cl. 264-347.000.
Ingenito, Michael J.; and Hartnett, Harold J., to General Time Corporation. Stepping motor. 4,115,714, Cl. 310-49.00R.
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, to Process Shizai Co., Ltd. Heat-sensitive recording materials and recording process of using the same. 4,115,613, Cl. 428-207.000.
Inoue, Yasukazu; and Kikuchi, Masanori, to Nippon Electric Co., Ltd. Gate controlled diode protection for drain of IGFET. 4,115,709, Cl. 307-304.000.
Inoue, Yoshio: *See*—
Noshiro, Atsumi; and Inoue, Yoshio, 4,115,329, Cl. 260-25.000.
Inpro, Inc.: *See*—
Orlowski, David Chester, 4,114,902, Cl. 277-53.000.
Institut Cerac SA.: *See*—
Cooper, George Anthony, 4,114,950, Cl. 299-15.000.
Institut Dr. Ing. Reinhard Straumann AG: *See*—
Straumann, Fritz, 4,115,156, Cl. 148-12.70N.
Wenger, Alfred, 4,114,423, Cl. 73-30.000.
Instituto Luso Farmaco d'Italia S.r.l.: *See*—
Manghisi, Elso; Salimbeni, Aldo; and Ferni, Giovanni, 4,115,585, Cl. 424-311.000.
Instrumentation Specialties Company: *See*—
Allington, Robert William, 4,115,861, Cl. 364-497.000.
Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, 4,115,779, Cl. 343-715.000.
Intel Corporation: *See*—
Salsbury, Phillip J.; Perlegos, George; and Morgan, William L., 4,114,255, Cl. 29-571.000.
International B. F. Goodrich-Europe B.V.: *See*—
Beernaerts, Andre M. H. J.; and Eskes, Hendrik J. K., 4,114,213, Cl. 5-345.00R.
International Business Machines Corporation: *See*—
Botte, Anthony Joseph, 4,114,871, Cl. 271-173.000.
Capowski, Robert S.; Wright, Lewis W.; and Zimmerman, Terrence K., 4,115,854, Cl. 364-200.000.
Clark, Kendall; and Shapiro, Milton R., 4,115,683, Cl. 219-121.00L.
Commander, Robert Duncan; Gardner, Peter Alan Edward; and Taylor, John Richard, 4,115,823, Cl. 360-77.000.
Croisier, Alain; and Jacquart, Christian, 4,115,660, Cl. 179-2.50R.
De La Moneda, Francisco H., 4,115,794, Cl. 357-23.000.
Dyer, Donald R.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,115,120, Cl. 96-36.200.
Eggenberger, John S.; and Hodges, Paul, 4,115,768, Cl. 340-347.0DD.
International Flavors & Fragrances Inc.: *See*—
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., 4,115,431, Cl. 260-465.00F.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,115,406, Cl. 260-345.100.
International Standard Electric Corporation: *See*—
Janssens, Juliaan Leo Gerard; and Malherbe, Marie Jeanne Francoise Louise Ghislaine, 4,115,866, Cl. 364-900.000.
Lalande, Jacques Alfred; and Thevin, Rene Roger, 4,115,743, Cl. 331-14.000.
Mash, Derek H.; Crossland, William A.; and Morrissy, Joseph H., 4,114,990, Cl. 350-337.000.
Thrush, Edward John, 4,115,223, Cl. 204-129.600.
International Telephone and Telegraph Corporation: *See*—
Asam, Adolf R.; and Maklad, Mokhtar S., 4,114,980, Cl. 350-96.330.
Johnson, Charles Bruce, 4,115,722, Cl. 315-52.000.
Keller, Donald A., 4,115,842, Cl. 362-183.000.

Selvin, Gerald Joseph; Oliver, Leland Wayne; Yamamoto, Stephen Kazuo; and Hogan, Clarence Vaughn, 4,114,976, Cl. 339-217.00S.
Valdes, Sergio F., 4,115,772, Cl. 343-6.50R.

Interox: *See*—
Brichard, Jean; and Colery, Jean-Claude, 4,115,519, Cl. 423-279.000.

InterRoyal Corporation: *See*—
Benoit, Roland A., 4,114,949, Cl. 297-445.000.

INTERx Research Corporation: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,115,588, Cl. 424-325.000.

Intong AB: *See*—
Hums, Dieter; Hergeth, Friedrich; and Wetzig, Werner, 4,115,140, Cl. 106-120.000.

Ionics, Inc.: *See*—
Parsi, Edgardo J., 4,115,225, Cl. 204-180.00P.

Irons, George S.: *See*—
Smashey, Russell W.; Frey, Elmer L.; Cash, George V.; and Irons, George S., 4,115,112, Cl. 75-171.000.

Ishibashi, Kazufumi; and Ichimura, Takeo, to Nippon Kogaku K.K. Optical glass. 4,115,131, Cl. 106-47.00Q.

Ishida, Nobuyasu: *See*—
Sugiura, Teruo; Tsubouchi, Hiromitsu; Ishida, Nobuyasu; and Kobayashi, Kiyonori, 4,114,740, Cl. 192-70.180.

Ishida, Tsutomu: *See*—
Kaneko, Yutaka; and Ishida, Tsutomu, 4,114,536, Cl. 101-426.000.

Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, to Nippon Telegraph and Telephone Public Corporation; and Fujikura Cable Works, Ltd., The. Optical fiber for communication. 4,114,981, Cl. 350-96.330.

Ishihara Sangyo Kaisha, Ltd.: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,115,102, Cl. 71-94.000.

Ishikawa, Kunio: *See*—
Yoshihara, Hiroshi; Tobita, Takashi; Tomizawa, Ryoichi; and Ishikawa, Kunio, 4,115,415, Cl. 260-410.000.

Isii, Sigeki: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,114,497, Cl. 84-1.170.

Isogaya, Kazuyoshi: *See*—
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.

Istituto Chemioterapico Italiano, S.p.A.: *See*—
Garzia, Aldo, 4,115,570, Cl. 424-248.570.

Itaya, Eiji: *See*—
Katoh, Tadayoshi; and Itaya, Eiji, 4,114,710, Cl. 178-67.000.

Ithakissios, Dionyssis S., to Minnesota Mining and Manufacturing Company. In vitro diagnostic test. 4,115,534, Cl. 424-1.000.

Ito, Chiaki, to Fujitsu Limited. Figure pre-processing device. 4,115,760, Cl. 340-146.30H.

Ito, Keizo, to Toyoda Gosei Co., Ltd. Structure for combining two bodies and sheeting. 4,114,339, Cl. 52-507.000.

Ito, Tosikazu: *See*—
Takahashi, Reijiro; Musoh, Masanori; and Ito, Tosikazu, 4,114,397, Cl. 62-516.000.

Itoh, Takesi: *See*—
Iguchi, Yoshio; Honma, Chuichi; Itoh, Takesi; and Hosokawa, Kazutaka, 4,114,427, Cl. 73-63.000.

Itoh, Tetsuro; Takahashi, Tetsuo; Kimura, Atsuyoshi; and Yamano, Seiichi, to Daido Tokushuko Kabushiki Kaisha. Free-cutting structural steel for machines. 4,115,111, Cl. 75-128.00P.

ITT Industries, Inc.: *See*—
Luepertz, Hans-Henning; and Fischenich, Bernhard, 4,114,430, Cl. 73-121.000.

ITW Fastex Italia, S.p.A.: *See*—
Aimar, Michele, 4,114,506, Cl. 85-32.00W.

Ivannikova, Galina Evgenievna: *See*—
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Iverson, Roger A. Reversible power transmission. 4,114,477, Cl. 74-768.000.

Iwamoto, Tamio: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, 4,114,999, Cl. 355-10.000.

Iwans, Robert C., to Koehler-Dayton, Inc. Toilet. 4,114,207, Cl. 4-319.000.

Iwasaki, Kenji; and Hijikata, Sotaro, to Tokyo Shibaura Electric Co., Ltd. Stationary anode X-ray tube. 4,115,717, Cl. 313-59.000.

Iwasaki, Tetsuji: *See*—
Sugimura, Yukio; Miyamoto, Norioki; Iwasaki, Tetsuji; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,115,103, Cl. 71-98.000.

Iwata, Mitsuo: *See*—
Kitazawa, Kunihiko; Mimura, Masuichiro; and Iwata, Mitsuo, 4,115,822, Cl. 360-74.000.

Iwatsu Electric Co., Ltd.: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, 4,114,999, Cl. 355-10.000.

Izbicki, Anthony J., to Hood & Co., Inc. Thermostat metal compositions. 4,115,624, Cl. 428-617.000.

J. Eberspacher: *See*—
Gerwin, Reinhard, 4,115,050, Cl. 431-352.000.

J.J. Lester & Co., Inc.: *See*—
Nackenson, Joel J., 4,114,240, Cl. 24-67.110.

J-Mark Quality Products, Inc.: *See*—
Kowalczyk, Adolph J., 4,114,481, Cl. 81-64.000.

Jackson, Billy G.; and McPherson, Roger E., to Eli Lilly and Company. Decolorizing process for 7-amino-3-(((2-methyl-1,3,4-thiadiazol-5-yl)thio)methyl)-3-cephem-4-carboxylic acid. 4,115,645, Cl. 544-20.000.

Jacob, Jose T.: *See*—
Every, Richard L.; and Jacob, Jose T., 4,115,139, Cl. 106-100.000.

Jacobs, Maxwell E.; and Aaldenberg, Eric R., to Detecto Scales, Inc. Electronic scale load cell protector. 4,114,709, Cl. 177-156.000.

Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread delivery device for textile machines. 4,114,822, Cl. 242-47.010.

Jacquart, Christian: *See*—
Croisier, Alain; and Jacquart, Christian, 4,115,660, Cl. 179-2.50R.

Jaeger, Oskar: *See*—
Barth, Rudolph; and Jaeger, Oskar, 4,115,195, Cl. 195-1.300.

Jaeggi, Knut A.: *See*—
Frei, Jorg; Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,115,575, Cl. 424-250.000.

Jager, Albert; Lucht, Alfred; and Munch, Gerhard, to Messer Griesheim GmbH. Device for removal of smoke gases, dust and the like. 4,114,864, Cl. 266-51.000.

Jager, Hans; and Seipp, Emil, to Metallurgie Hoboken-Overpelt. Method of epitaxial deposition of an $A_{III}B_V$-semiconductor layer on a germanium substrate. 4,115,164, Cl. 148-175.000.

Jahn, Eberhard: *See*—
Siegler, Gustav; and Jahn, Eberhard, 4,115,018, Cl. 408-239.00A.

Jahn, Ulrich: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,115,393, Cl. 260-295.50R.

James, Helen J.: *See*—
Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., 4,115,209, Cl. 204-1.00T.

James, Robert Frederic, to Auto-Chlor Inc. Periodic chlorination and superchlorination of recirculating swimming pool water. 4,115,263, Cl. 210-60.000.

James Ross Limited: *See*—
Brown, Jack Frederick, 4,114,228, Cl. 15-256.510.

Jamesbury Corp.: *See*—
MacAfee, Jerry D.; and Collette, Ronald J., 4,114,856, Cl. 251-306.000.

Jamieson, Geoffrey A.: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,115,281, Cl. 252-8.800.

Jankelewitz, Eliezer; and Benedict, John Pinhas. Lock structure. 4,114,933, Cl. 292-37.000.

Janner, Karl; and Gregorius, Klaus, to Kraftwerk Union Aktiengesellschaft. Separation of gaseous mixtures of matter. 4,115,078, Cl. 55-2.000.

Jansen-Herfeld, Rottger; and Elmer, Stefan, to Schmid & Wezel. Butcher's meat saw. 4,114,270, Cl. 30-394.000.

Janssens, Juliaan Leo Gerard; and Malherbe, Marie Jeanne Francoise Louise Ghislaine, to International Standard Electric Corporation. Data processing network for communications switching system. 4,115,866, Cl. 364-900.000.

Japan Crown Cork Co., Ltd.: *See*—
Shinozaki, Tokujiro, 4,114,775, Cl. 215-324.000.

Jarman, David J. Material handling means. 4,114,418, Cl. 72-386.000.

Jarvis, Clarence W.; and Wenrich, Richard A. Pool hand cleaning device holder. 4,114,321, Cl. 51-205.00R.

Jeal, Harvey Philip, to Aerpat A.G. Self-drilling screw. 4,114,508, Cl. 85-41.000.

Jeffers, William Q.: *See*—
Buonadonna, Victor R.; Richardson, Ralph J.; Rasmussen, Richard L.; and Jeffers, William Q., 4,115,168, Cl. 149-109.600.

Jelinek, Jerry G., to Parker-Hannifin Corporation. Sealed joint and gasket therefor. 4,114,906, Cl. 277-166.000.

Jenis, Donald S.; Kuczkowski, Thomas A.; Mazer, Jack S.; and Westerkamp, Douglas F., to General Electric Company. Tube support system for heat exchanger. 4,114,684, Cl. 165-82.000.

Jennings, Harley Y., Jr., to Chevron Research Company. Transporting iron ore slurries. 4,114,956, Cl. 302-66.000.

Jensen, Gerald A.; Larson, Louis A.; and Diesch, Robert E., to Pako Corporation. Automatic sorting, conveying and packing mechanism for photographic prints. 4,114,349, Cl. 53-54.000.

Jerabek, Robert D.: *See*—
Zwack, Robert R.; and Jerabek, Robert D., 4,115,226, Cl. 204-181.00C.

Jeromin, Lutz: *See*—
Dieckelmann, Gerhard; Jeromin, Lutz; and Tollkotter, Gunther, 4,115,411, Cl. 260-348.260.

JFD Electronics Corporation: *See*—
Snow, Robert Eric, 4,115,778, Cl. 343-701.000.

Jogand, Patrick, to Commissariat a l'Energie Atomique. Fast neutron nuclear reactor. 4,115,192, Cl. 176-40.000.

Joh, Yasushi. Flame retardant composition. 4,115,351, Cl. 260-45.9NP.

Johansson, Bengt, to Centro-Maskin Goteborg AB. Method and apparatus for workpiece surface treatment. 4,115,151, Cl. 148-9.500.

Johansson, Bengt, to Centro-Maskin Goteborg AB. Method and device for gas planing a workpiece surface to remove surface defects. 4,115,152, Cl. 148-9.500.

Johansson, Bengt, to Centro-Maskin Goteborg AB. Method at gas planing. 4,115,153, Cl. 148-9.500.

John, Phillip Merrill, to Sterling Drug Inc. Pharmaceutical steroid formulation. 4,115,563, Cl. 424-241.000.

Johns Hopkins University, The: *See—*
Seylar, George R., 4,114,606, Cl. 128-2.05E.

Johnson, Andrew P. Gas-fluid-sound isolation door assembly with integral testing means. 4,114,424, Cl. 73-40.000.

Johnson, Bill E.; and Dannenmann, John E., Jr., to Bejed, Inc. Data interface bridge. 4,115,849, Cl. 340-147.0CV.

Johnson, Charles Bruce, to International Telephone and Telegraph Corporation. Corona-shield for an image-tube photocathode. 4,115,722, Cl. 315-52.000.

Johnson, Charles E., to Double A Products Company. Variable differential pressure unloading valve apparatus. 4,114,637, Cl. 137-116.000.

Johnson, Claude, Jr.: *See—*
Dyer, Donald R.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,115,120, Cl. 96-36.200.

Johnson, David Charles: *See—*
Hansen, Niels Junior; Ward, John Ambrose; Hintze, William; and Johnson, David Charles, 4,115,750, Cl. 337-107.000.

Johnson, Donald B.: *See—*
Vick, Howard Andrew; and Johnson, Donald B., 4,115,864, Cl. 364-550.000.

Johnson, Howard L., to Caterpillar Tractor Co. Anti-cavitation and pressure modulating relief valve for controlling hydraulic cylinders. 4,114,516, Cl. 91-420.000.

Johnson, John H.: *See—*
Fields, Joseph E.; and Johnson, John H., 4,115,550, Cl. 424-78.000.

Johnson, Robert B., to Eastman Kodak Company. Concentric reel drive for a tape cassette. 4,114,831, Cl. 242-194.000.

Johnson, Robert C.: *See—*
Smith, Linda Hebert; and Johnson, Robert C., 4,114,200, Cl. 2-51.000.

Johnson, Winston O.; and Crabb, Jerry A. Tire correction system. 4,114,279, Cl. 33-178.00R.

Johnston, David J.: *See—*
Shivak, Robert A.; and Johnston, David J., 4,114,851, Cl. 251-88.000.

Jonckers, Kees: *See—*
Biermans, Andreas J.; and Jonckers, Kees, 4,115,449, Cl. 260-555.00A.

Jones, Alan P.; and Sherman, William, to Brandt-Pra, Inc. Counterfeit detection means for paper counting. 4,114,804, Cl. 235-476.000.

Jones, Arthur Lee, to Pelton & Crane Company. Movable power-operated instrument console and treatment chair apparatus. 4,114,274, Cl. 32-22.000.

Jones, Arthur Lee; and Leffler, Dennis Frank, to Pelton & Crane Company. Foot controller apparatus for air driven dental handpieces or the like. 4,114,275, Cl. 32-22.000.

Jones, Harold E.; and Ottenweller, Donald T. Wall panel unit. 4,114,333, Cl. 52-265.000.

Jones, James R.: *See—*
Bulson, Walter T.; Christie, Peter A.; and Jones, James R., 4,115,423, Cl. 260-429.500.

Jones, John Alexander. Vehicle-lift superstructure. 4,114,728, Cl. 187-8.750.

Jones, Terry H.; and Oakes, John J., to Clarke-Gravely Corporation. Surface cleaning apparatus. 4,114,229, Cl. 15-320.000.

Jones, Thomas C. Tank trailer. 4,114,917, Cl. 280-116.000.

Jones, William C. Skate exercise device. 4,114,873, Cl. 272-61.000.

Jordan, Bertram Lee; and Mitchell, John Davis, to Harrington Manufacturing Company. Implement for handling a bulk tobacco container. 4,114,770, Cl. 214-130.00R.

Jordan, Charles H.; and Sampat, Ajit, to Fluor Corporation. Recovery of light hydrocarbons from refinery gas. 4,115,086, Cl. 62-28.000.

Jordan, Edgar R. Valve deactuator for internal combustion engines. 4,114,588, Cl. 123-198.00F.

Jordan, J. Kirk, to Beatrice Foods Co. Process for coloring maraschino cherries with natural colors. 4,115,595, Cl. 426-250.000.

Joseloff, Stanley. Supermarket counter construction and method of using same. 4,114,727, Cl. 186-1.0AC.

Joslyn, Larry James, to Sybron Corporation. Air detecting device for steam or gas sterilizers. 4,115,068, Cl. 422-56.000.

Joynt, Gerald E.; and Mayhew, Michael R., to Multech Corp. Telescopic tailgate extension. 4,114,944, Cl. 296-50.000.

JRC Products, Inc.: *See—*
Taitel, Charles M.; and Ryan, Ralph L., 4,114,909, Cl. 279-1.00Q.

Jukkola, Walfred Wilhelm; and Tomasicchio, Giorgio, to Dorr-Oliver Incorporated. Transfer pipe system. 4,115,070, Cl. 422-142.000.

Jurkiewitsch, George: *See—*
Gupta, Rakesh Kumar; Jurkiewitsch, George; and Logan, Lawrence Joseph, 4,115,620, Cl. 428-374.000.

K-Tron Soder AG: *See—*
Saner, Kaspar, 4,114,708, Cl. 177-145.000.

Kabanov, Viktor Alexandrovich: *See—*
Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,468, Cl. 260-683.15D.
Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,469, Cl. 260-683.15D.

Kabushiki Kaisha Daini Seikosha: *See—*
Matsuura, Eiichi; Takahashi, Keikichi; Tsukada, Nobuo; and Tatsumi, Yoshio, 4,114,365, Cl. 58-23.0BA.
Takahashi, Norio, 4,114,364, Cl. 58-23.00D.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Wada, Mitsuyoshi; Shimada, Hideyuki; and Ohta, Koji, 4,115,023, Cl. 404-98.000.

Kabushiki Kaisha Nihon Kotai Kenkyujo: *See—*
Mizuta, Toshinobu; and Hayashi, Tooru, 4,115,699, Cl. 250-461.00B.

Kabushiki Kaisha Seikosha: *See—*
Kanazawa, Masayuki, 4,115,770, Cl. 340-396.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Imamura, Yoichi, 4,114,363, Cl. 58-23.00R.

Kagedal, Sven Lennart: *See—*
Rothman, Ulf Sven Erik; Kagedal, Sven Lennart; and Soderberg, John Lennart, 4,115,536, Cl. 424-1.000.

Kahley, Vance F., Sr. Tape laying trenching apparatus. 4,114,391, Cl. 405-176.000.

Kajimoto, Norifumi: *See—*
Kubota, Yuichi; and Kajimoto, Norifumi, 4,115,290, Cl. 252-62.540.

Kakogawa, Genjiro: *See—*
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,532, Cl. 423-492.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,533, Cl. 423-492.000.

Kaku, Hidetoshi: *See—*
Amano, Toshio; and Kaku, Hidetoshi, 4,114,587, Cl. 123-196.00S.

Kakuta, Akio: *See—*
Ohno, Masayoshi; Kakuta, Akio; Miyauchi, Terukatsu; and Kikuchi, Tatsuji, 4,115,081, Cl. 55-64.000.

Kalfus, Martin Aaron, to RCA Corporation. Circuit for single-line control of GTO controlled rectifier conduction. 4,115,707, Cl. 307-252.00C.

Kaljuzhnaya, Galina Alexandrovna: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Kalka, Josef, to Chemische Werke Huls AG. Aftertreatment of spray dried, powdered vinyl chloride emulsion polymerizates. 4,115,640, Cl. 528-483.000.

Kalnin, Igor Martynovich: *See—*
Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Scherbakov, Vsevolod Sergeevich; and Gruzintsev, Igor Andreevich, 4,115,043, Cl. 417-559.000.

Kalt Manufacturing Company, The: *See—*
Fischer, Donald A.; Lipowski, Edwin M.; and Kalt, William E., 4,114,507, Cl. 85-41.000.

Kalt, William E.: *See—*
Fischer, Donald A.; Lipowski, Edwin M.; and Kalt, William E., 4,114,507, Cl. 85-41.000.

Kaltenbach & Voigt GmbH & Co.: *See—*
Hoffmeister, Jurgen; and Saupe, Martin, 4,114,946, Cl. 297-191.000.

Kambara, Masahiro: *See—*
Morio, Minoru; and Kambara, Masahiro, 4,115,820, Cl. 360-33.000.

Kametani, Hiroshi; and Aoki, Aiko, to National Research Institute For Metals. Method for electrolytic winning of lead. 4,115,222, Cl. 204-117.000.

Kaminski, Chester J.: *See—*
Gancy, Alan B.; and Kaminski, Chester J., 4,115,219, Cl. 204-99.000.

Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. Antibacterial novel soft n-chloroamino alcohol derivatives. 4,115,588, Cl. 424-325.000.

Kamman, Gordon W., to Houdaille Industries, Inc. Method of and means for making tuned viscous torsional vibration dampers. 4,114,246, Cl. 29-451.000.

Kanazawa, Masayuki, to Kabushiki Kaisha Seikosha. A buzzer having adjustable buzzer sound. 4,115,770, Cl. 340-396.000.

Kandler, Joachim: *See—*
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,115,522, Cl. 423-322.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Kinoshita, Yoshikiyo; Aoi, Takashi; Kimura, Yoshihiro; and Amisaki, Yumiko, 4,115,480, Cl. 260-885.000.

Kaneko, Yutaka; and Ishida, Tsutomu, to Ricoh Co., Ltd. Method of and apparatus for transfer printing a toner image. 4,114,536, Cl. 101-426.000.

Kanki, Hiroshi; Yasuda, Kazuyoshi; and Tatsuke, Hisashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for supporting a bobbin holder shaft in a high speed winder. 4,114,819, Cl. 242-18.00R.

Kantor, Ilya Solomonovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonevich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Kao, Jar-lin: *See—*
Sheng, Ming Nan; and Kao, Jar-lin, 4,115,440, Cl. 562-533.000.

Kao Soap Co., Ltd.: *See—*
Sugimura, Yukio; Miyamoto, Norioki; Iwasaki, Tetsuji; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,115,103, Cl. 71-98.000.

Kapcoa Corp.: *See—*
Blahut, Edward J., 4,115,845, Cl. 362-403.000.

Karl Storz Endoscopy-America, Inc.: *See*—
Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, 4,114,623, Cl. 128-303.140.

Karlen, Urs: *See*—
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,115,056, Cl. 8-39.00B.

Karol, Frederick John; Wu, Chisung; Reichle, Walter Thomas; and Maraschin, Norma Jean, to Union Carbide Corporation. Cyclopentadienyl chromium oxides. 4,115,425, Cl. 260-438.50R.

Kasagi, Takao; Kuwakado, Satoshi; and Takei, Toshihiro, to Nippon Soken, Inc. Inflatable bag apparatus for protecting occupants in vehicles. 4,114,924, Cl. 280-740.000.

Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, to Aisin Seiki Company, Limited. Sewing machine with base extension. 4,114,548, Cl. 112-258.000.

Kashiwabara, Akira: *See*—
Kubotera, Kikuo; Kashiwabara, Akira; and Sato, Kotaro, 4,115,118, Cl. 96-33.000.

Kasik, Robert L.: *See*—
Zavagli, Steven B.; and Kasik, Robert L., 4,115,376, Cl. 260-120.000.

Kasper, Horst Manfred; Tell, Benjamin; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Electrochemical device comprising ternary ionic conductors. 4,115,633, Cl. 429-191.000.

Kato, Hideo; Koshinaka, Eiichi; Kurata, Sakae; and Uesaka, Ikuo, to Hokuriku Pharmaceutical Co., Ltd. Monofumarate salt of 3-pyridylmethyl nicotinate. 4,115,392, Cl. 260-295.50R.

Kato, Masayuki: *See*—
Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, 4,114,548, Cl. 112-258.000.

Kato, Tetuo, to Tokico Ltd. Hydraulic damper and valve structure. 4,114,735, Cl. 188-282.000.

Kato, Tetuo, to Tokico Ltd. Gas filling arrangement for a telescopic suspension unit. 4,114,866, Cl. 267-64.00R.

Katoh, Tadayoshi; and Itaya, Eiji, to Fujitsu Limited. Carrier regeneration circuit. 4,114,710, Cl. 178-67.000.

Katsura Machine Co., Ltd.: *See*—
Sekiguchi, Yoji, 4,114,773, Cl. 214-623.000.

Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, to Toyo Soda Manufacturing Co., Ltd. Process for producing ammonium p-styrenesulfonate. 4,115,436, Cl. 260-505.00N.

Kaufman, Menachen, to Houdaille Industries, Inc. Machine tool controller employing microprocessor system for controlling Z axis. 4,115,858, Cl. 364-474.000.

Kavesh, Sheldon; and Bretts, Gerald R., to Allied Chemical Corporation. Welding of glassy metallic materials. 4,115,682, Cl. 219-118.000.

Kavun, Semen Moiseevich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,114,496, Cl. 84-1.100.

Kawakami, Hiromi: *See*—
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,115,737, Cl. 325-459.000.

Kawaken Fine Chemicals Co., Ltd.: *See*—
Hiiro, Takeshi; Sakurai, Hideki; and Kondo, Fumihiko, 4,115,426, Cl. 260-448.20E.

Kawamura ainstitute of Chemical Research: *See*—
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.

Kawamura, Kiyoshi: *See*—
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Amano, Toshio; and Kaku, Hidetoshi, 4,114,587, Cl. 123-196.00S.
Fujikawa, Tetsuzo; and Misawa, Kichiji, 4,114,586, Cl. 123-195.00A.
Matsuda, Munekazu, 4,114,371, Cl. 60-282.000.
Matsuda, Munekazu; and Sakaue, Yoshiaki, 4,114,572, Cl. 123-59.0PC.

Kawase, Shoji: *See*—
Inata, Hiroo; and Kawase, Shoji, 4,115,362, Cl. 528-190.000.

Kawneer Company, Inc.: *See*—
Sukolics, Ronald D., 4,114,330, Cl. 52-200.000.

Kay Manufacturing Corp.: *See*—
Krakauer, Edwin G., 4,114,212, Cl. 5-267.000.

Keedy, David E.: *See*—
Davis, Warren W.; and Keedy, David E., 4,114,368, Cl. 60-39.16R.

Keenan, Thomas W.: *See*—
Morre, D. James; Kloppel, Thomas M.; and Keenan, Thomas W., 4,115,062, Cl. 23-230.00B.

Keller, Donald A., to International Telephone and Telegraph Corporation. Flashlight and flashlight charging receptacle. 4,115,842, Cl. 362-183.000.

Keller, Hartmut: *See*—
Schubert, Klaus-Peter; Keller, Hartmut; and Hildebrandt, Juergen J., 4,114,464, Cl. 74-89.140.

Kellner, Jerome C., to Plastics Engineering Company. Phenolic resin-melamine composition. 4,115,366, Cl. 528-131.000.

Kelly, Donald V. Handle for sliding window. 4,114,934, Cl. 292-87.000.

Kelly, Edward G., to GAF Corporation. Method and product for installation of sheet flooring. 4,114,346, Cl. 52-746.000.

Kelly, Virgil M., to Purex Corporation. Multi-port backwash valve. 4,115,276, Cl. 210-425.000.

Kelman, Arnold Lloyd, to General Electric Company. Gantry for computed tomography. 4,115,695, Cl. 250-445.00T.

Kemanord AB: *See*—
Larsson, Karl-Georg; and Norell, Maria, 4,115,217, Cl. 204-95.000.
Larsson, Karl-Georg; and Norell, Maria, 4,115,217, Cl. 204-95.000.
Larsson, Karl-Georg; and Norell, Maria, 4,115,217, Cl. 204-95.000.

Kendall-Smith, Brian John; and Bonnington, Michael Glynn, to British Industrial Plastics Ltd. Moulding of filled synthetic plastics moulding compositions. 4,115,509, Cl. 264-331.000.

Kendig, Albert Prall: *See*—
Patterson, Marvin LeRoy; Haselby, Robert Dale; and Kendig, Albert Prall, 4,115,726, Cl. 318-171.000.

Kennedy-Skipton, Henry Kinny, to Imperial Chemical Industries Limited. Method of securing fixing elements in rock. 4,114,384, Cl. 405-260.000.

Kennedy, William Alvis, to Texaco Development Corp. Cross-linker for flexible and semi-flexible polyurethane foams. 4,115,301, Cl. 521-155.000.

Kerfoot, Derek G. E., to Noranda Mines Limited. Method for removing arsenic from copper and/or nickel bearing aqueous acidic solutions by solvent extraction. 4,115,512, Cl. 423-24.000.

Kern, Rene: *See*—
Foy, Paul; and Kern, Rene, 4,115,475, Cl. 260-857.0PE.

Kershner, Marvin R.: *See*—
Nicodemus, Robert N., Jr.; Bosler, James W.; and Kershner, Marvin R., 4,114,538, Cl. 104-88.000.

Kesler, Michael G., to Mobil Oil Corporation. Method for separating the product effluent of an alkylation process. 4,115,471, Cl. 260-683.430.

Kesling, Peter C. Athletic mouthguard. 4,114,614, Cl. 128-136.000.

Kevvai, Arnold Arnoldovich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.
Nudelman, Boris Izrailovich; Sventsitsky, Alexandr Sergeevich; Bikbau, Marsel Yanovich; Bun, Isaak Mozesovich; and Kevvai, Arnold Arnoldovich, 4,115,138, Cl. 106-100.000.

Khokhlov, Lev Mikhailovich: *See*—
Vladimirov, Evgeny Evgenievich; Korchagin, Vladimir Gerasimovich; Sadomov, Jury Borisovich; and Khokhlov, Lev Mikhailovich, 4,115,867, Cl. 364-900.000.

Kienel, Gerhard; and Petersein, Helmut, to Leybold-Heraeus GmbH & Co. KG. Electron beam vaporizer. 4,115,653, Cl. 13-31.000.

Kihara, Keiichi: *See*—
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,115,436, Cl. 260-505.00N.

Kikkoman Shoyu Co. Ltd.: *See*—
Noda, Fumio; Mogi, Keitaro; and Sakasai, Toshio, 4,115,591, Cl. 426-7.000.

Kikuchi, Katsutoshi: *See*—
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.

Kikuchi, Masanori: *See*—
Inoue, Yasukazu; and Kikuchi, Masanori, 4,115,709, Cl. 307-304.000.

Kikuchi, Tatsuji: *See*—
Ohno, Masayoshi; Kakuta, Akio; Miyauchi, Terukatsu; and Kikuchi, Tatsuji, 4,115,081, Cl. 55-64.000.

Kikuga, Toyoji; and Hirai, Koji, to Sumitomo Durez Company, Ltd. Phenolic resin color developing compositions for copying papers and methods of preparation. 4,115,327, Cl. 260-17.200.

Kim, Samuel S.: *See*—
Emmons, William D.; Kim, Samuel S.; and Winey, Donald A., 4,115,169, Cl. 156-71.000.

Kimbell, Charles L. Method of testing an analyzer to determine the accuracy thereof and a volumetric primary standard apparatus for doing same. 4,114,419, Cl. 73-1.00G.

Kimberly-Clark Corporation: *See*—
Hultman, David P.; and Bergsbaken, Jack L., 4,115,605, Cl. 427-377.000.

Kimmell, Steven Donald, to Mattel, Inc. Wheel assembly for a skateboard or the like. 4,114,952, Cl. 301-5.700.

Kimura, Atsuyoshi: *See*—
Itoh, Tetsuro; Takahashi, Tetsuo; Kimura, Atsuyoshi; and Yamano, Seiichi, 4,115,111, Cl. 75-128.00P.

Kimura, Isao; and Yata, Sizukuni, to Nippon Kynol Incorporated. Process for producing modified phenolic novolak fibers. 4,115,364, Cl. 260-841.000.

Kimura, Tadashi, to Olympus Optical Co., Ltd. Variant Ernostar type long focus lens system. 4,114,992, Cl. 350-216.000.
Kimura, Yoshihiro: *See*—
Kinoshita, Yoshikiyo; Aoi, Takashi; Kimura, Yoshihiro; and Amisaki, Yumiko, 4,115,480, Cl. 260-885.000.
King, Lowell A.: *See*—
Nardi, John C.; Hussey, Charles L.; King, Lowell A.; and Carpio, Ronald A., 4,115,390, Cl. 260-290.0HL.
Kinoshita, Hirotugu; Sekiya, Makoto; and Makino, Nobuo, to Nippon Oil Co., Ltd. Brake grease compositions. 4,115,284, Cl. 252-29.000.
Kinoshita, Kimio; and Ackerman, John P., to United States of America, Energy. Method of preparing electrolyte for use in fuel cells. 4,115,632, Cl. 429-188.000.
Kinoshita, Yoshikiyo; Aoi, Takashi; Kimura, Yoshihiro; and Amisaki, Yumiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of production of acrylic resin for film use and an acrylic resin obtained therefrom. 4,115,480, Cl. 260-885.000.
Kinsella, Lawrence M.: *See*—
Carlson, Carl S.; Kinsella, Lawrence M.; and Pixley, Daniel L., 4,115,185, Cl. 156-634.000.
Kinsho, Yoshio: *See*—
Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, 4,115,516, Cl. 423-239.000.
Kirch, Otto; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine with a workpiece guide mechanism. 4,114,546, Cl. 112-153.000.
Kirner, Hans Dieter; Bitterlin, Albert; and Muller, Ekkehard Walter, to Rohner AG Pratteln. Mixture of water-insoluble monoazo dyestuffs for coloring textile materials consisting at least partly of linear, aromatic polyesters. 4,115,055, Cl. 8-26.000.
Kish, Arthur S., to Murray Corporation. Hose assembly. 4,114,656, Cl. 138-109.000.
Kissell, Ronald E.; and Gambill, Ulysses T., to Owens-Corning Fiberglas Corporation. Method and apparatus for molding articles from fibrous material. 4,115,498, Cl. 264-119.000.
Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Positive image forming radiation sensitive compositions containing diazide compound and organic cyclic anhydride. 4,115,128, Cl. 96-91.00D.
Kitazawa, Kunihiko; Mimura, Masuichiro; and Iwata, Mitsuo. to Victor Company of Japan, Limited. Automatic start and shut-off apparatus for magnetic-tape sound recorder. 4,115,822, Cl. 360-74.000.
Kittredge, Lloyd G., to Pitney-Bowes, Inc. Automatic postage meter date setter. 4,114,533, Cl. 101-99.000.
Kiwala, Jacob: *See*—
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,115,406, Cl. 260-345.100.
Klaschka, Rudolf. Method for mounting of electrical components, in particular electrolyte capacitors. 4,114,244, Cl. 29-25.410.
Klauke, Erich: *See*—
Bien, Hans-Samuel; Klauke, Erich; and Wunderlich, Klaus, 4,115,378, Cl. 260-146.00T.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Florjancic, Dusan; and Matthias, Heinz-Bernd, 4,115,029, Cl. 415-211.000.
Kleineisel, Gustav; Kuchenbecker, Dietrich; and Ahrens, Gerd, to Linde Aktiengesellschaft. Control device for a hydraulic system having at least two pumps. 4,115,033, Cl. 417-216.000.
Kleiner, Wayne E., to W. R. Grace & Co. Shock absorbing device and container. 4,114,761, Cl. 206-591.000.
Klimkin, Nikolai Emelyanovich: *See*—
Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich, 4,114,415, Cl. 72-214.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Otte, Wilhelm; Bergmann, Gunther; and Kubitza, Kar-Heinz, 4,115,265, Cl. 210-68.000.
Kloppel, Thomas M.: *See*—
Morre, D. James; Kloppel, Thomas M.; and Keenan, Thomas W., 4,115,062, Cl. 23-230.00B.
Kluender, Harold Clinton: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,453, Cl. 260-586.00G.
Knapik, H. Peter G.: *See*—
Adams, Frank H.; and Knapik, H. Peter G., 4,115,253, Cl. 208-139.000.
Knapp, Heinrich, to Robert Bosch GmbH. Plastic pipe or hose connection for fuel conduits. 4,114,929, Cl. 285-45.000.
Knauf, James E. Carrier for skis and ski poles. 4,114,838, Cl. 224-45.00S.
Kneebone, Barbara M.: *See*—
Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., 4,115,209, Cl. 204-1.00T.
Kneubuhler, Werner: *See*—
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,115,056, Cl. 8-39.00B.
Knight, Peter Charles, to Girling Limited. Automatic slack adjusters for vehicle brake linkages. 4,114,733, Cl. 188-196.0BA.
Knoll AG.: *See*—
Dengel, Ferdinand, 4,115,432, Cl. 260-465.00E.
Knorr, Manfred, to Franz Klaus-Union. Permanent magnet type pump. 4,115,040, Cl. 417-420.000.
Knud, Vagn Valbjorn, to Danfoss A/S. Apparatus for heating, cooling or air-conditioning a room. 4,114,682, Cl. 165-39.000.
Knutrud, Leif Brudal, to Norsk Cerealinstitutt ved Statens Teknologiske Institutt. Method for reducing the temperature of bakery products. 4,115,596, Cl. 426-497.000.
Kobayashi, Kazuhiro: *See*—
Miura, Yoshio; Kobayashi, Kazuhiro; and Yusa, Koue, 4,114,432, Cl. 72-135.000.
Kobayashi, Kiyonori: *See*—
Sugiura, Teruo; Tsubouchi, Hiromitsu; Ishida, Nobuyasu; and Kobayashi, Kiyonori, 4,114,740, Cl. 192-70.180.
Kobayashi, Sadao; and Okita, Yasuo, to Mitsui Toatsu Kagaku Kabushiki Kaisha (Mitsui Toatsu Chem., Inc.). Metallic tone coating composition. 4,115,338, Cl. 260-29.4UA.
Kobayashi, Toshiaki: *See*—
Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, 4,114,981, Cl. 350-96.330.
Koch, Bernard C. Golf club. 4,114,886, Cl. 273-162.00B.
Koch, Guido. Knee bending device. 4,114,610, Cl. 128-25.00R.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, to Ciba-Geigy Corporation. 7α Ureido cephem-4-carboxylic acid derivatives. 4,115,566, Cl. 424-246.000.
Kodama, Kazumi: *See*—
Goto, Kuniaki; and Kodama, Kazumi, 4,115,355, Cl. 260-45.95H.
Koehler-Dayton, Inc.: *See*—
Iwans, Robert C., 4,114,207, Cl. 4-319.000.
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich. Modified and stabilized synthetic cis-1,4 polyisoprene and method for producing same. 4,115,636, Cl. 526-47.600.
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, to Iwatsu Electric Co., Ltd. Apparatus for making plates for printing. 4,114,999, Cl. 355-10.000.
Kogure, Yoichi; Minoura, Toshimi; and Fujiwara, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and system of controlling plants. 4,115,848, Cl. 364-107.000.
Kohama, Tokio: *See*—
Hattori, Tadashi; Nakase, Takamichi; and Kohama, Tokio, 4,114,578, Cl. 123-124.00R.
Kohara, Tadashi: *See*—
Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, 4,114,358, Cl. 57-51.000.
Kohji, Toda: *See*—
Sato, Heihachi; and Kohji, Toda, 4,115,747, Cl. 331-94.50M.
Kohler, Ulf, to Linden-Alimak AB. Halt selector system. 4,114,729, Cl. 187-29.00R.
Koise, Yuji: *See*—
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.
Kojima, Moriaki: *See*—
Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, 4,114,981, Cl. 350-96.330.
Kojima, Yoichi, to Planning Kogyo Kabushiki Kaisha. Apparatus for rotating heavy objects. 4,114,765, Cl. 214-1.0QC.
Kokubu, Yoshinori: *See*—
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,115,815, Cl. 358-260.000.
Kolbe, John L.: *See*—
Wadsworth, Milton E.; Miller, Jan D.; Herbst, John A.; Kolbe, John L.; and Hayden, Howard Wayne, 4,115,221, Cl. 204-108.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, to Ciba-Geigy AG. Methods for dyeing or printing using amino-anthraquinone reactive disperse dyes. 4,115,056, Cl. 8-39.00B.
Koltsov, Sergei Ivanovich: *See*—
Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich, 4,114,415, Cl. 72-214.000.
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, to Sony Corporation. Manufacturing apparatus for tape cassette. 4,114,252, Cl. 29-563.000.
Konan Electric Co., Ltd.: *See*—
Nakajima, Hiroyuki; and Hosokawa, Takashi, 4,114,648, Cl. 137-625.500.
Kondis, Thomas J.: *See*—
Booz, Albert David; and Kondis, Thomas J., 4,115,107, Cl. 75-0.50R.
Kondo, Fumihiko: *See*—
Hiiro, Takeshi; Sakurai, Hideki; and Kondo, Fumihiko, 4,115,426, Cl. 260-448.20E.

Kondo, Takajiro: *See*—
Hashimoto, Yoshitoshi; Kondo, Takajiro; and Asamoto, Toshitaka, 4,114,491, Cl. 83-341.000.

Kondo, Toshihiro, to Fuji Photo Film Co., Ltd.; and Fuji Photo Film Co. Ltd. Focus detecting system. 4,114,994, Cl. 352-139.000.

Konig, Rudolf; and Brunsch, Klaus, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Connecting element for introducing forces into a structural part. 4,114,962, Cl. 308-238.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, 4,115,117, Cl. 96-29.00D.

Korchagin, Vladimir Gerasimovich: *See*—
Vladimirov, Evgeny Evgenievich; Korchagin, Vladimir Gerasimovich; Sadomov, Jury Borisovich; and Khokhlov, Lev Mikhailovich, 4,115,867, Cl. 364-900.000.

Koregelos, George. Demoisturizer for wind musical instruments. 4,114,504, Cl. 84-453.000.

Kornis, Gabriel: *See*—
Moon, Malcolm W.; and Kornis, Gabriel, 4,115,649, Cl. 544-140.000.

Kosaka, Kimito; Umehara, Kunio; and Maruyama, Takeshi, to Hitachi, Ltd. Circuit for extinguishing abnormally high voltage in television receiver. 4,115,814, Cl. 358-243.000.

Koshinaka, Eiichi: *See*—
Kato, Hideo; Koshinaka, Eiichi; Kurata, Sakae; and Uesaka, Ikuo, 4,115,392, Cl. 260-295.50R.

Kosswig, Kurt: *See*—
Coenen, Alfred; Kosswig, Kurt; and Prominski, Gunter, 4,115,530, Cl. 423-488.000.

Kostylev, Alexandr Dmitrievich: *See*—
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich, 4,114,700, Cl. 175-19.000.

Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing silicon-nitrogen compounds. 4,115,427, Cl. 260-448.20E.

Kovalev, Nikolai Fedorovich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Kowa Company Ltd.: *See*—
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.

Kowalczyk, Adolph J., to J-Mark Quality Products, Inc. Oil filter wrench with ratchet drive. 4,114,481, Cl. 81-64.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Cirkel, Hans-Jurgen, 4,115,833, Cl. 361-303.000.
Janner, Karl; and Gregorius, Klaus, 4,115,078, Cl. 55-2.000.

Krakauer, Edwin G., to Kay Manufacturing Corp. Bed spring unit and method. 4,114,212, Cl. 5-267.000.

Krall, Thomas J., to Owens-Illinois, Inc. Method for molding a threaded bunghole. 4,115,496, Cl. 264-94.000.

Kramer, Klaus; Dietrich, Toni; and Braun, Peter, to Wilhelm Will KG. Optical-electronic microscopy apparatus and process. 4,115,802, Cl. 358-93.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 3,3-Dichloro-2-azetidinone derivatives having basic substituents. 4,115,382, Cl. 260-239.00A.

Krapf, Heinz: *See*—
Oppenlaender, Knut; Seib, Karl; and Krapf, Heinz, 4,115,314, Cl. 252-309.000.

Kraus, Willibald; and Greulich, Bodo Arthur, to TRW Inc. Wedge base bulb socket. 4,114,972, Cl. 339-65.000.

Krause, Horst-Jurgen; Hase, Christian; and Bloching, Helmut, to Henkel Kommanditgesellschaft auf Aktien. Compositions and method for activating oxygen utilizing cyclic ester-anhydrides of α-hydroxycarboxylic acids. 4,115,309, Cl. 252-186.000.

Krautkramer-Branson, Incorporated: *See*—
Walker, Philip A., 4,114,455, Cl. 73-597.000.

Krider, Edmund Philip; Noggle, Ralph Carl; and Uman, Martin Allan, to University of Arizona Foundation, The. Detection system for lightning. 4,115,732, Cl. 324-72.000.

Krijne, Johannes: *See*—
Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and De Haan, Friedrich Jacobus, administrator, 4,114,406, Cl. 68-24.000.

Kristensson, Sten Krister; and Stamvik, Anders Robert, to Aktiebolaget Leo. Estramustine phosphate alcohol complexes, their preparation, and their use as intermediates in purification of said compound and salts thereof. 4,115,414, Cl. 260-397.500.

Kristiansen, Odd: *See*—
Boger, Manfred; and Kristiansen, Odd, 4,115,561, Cl. 424-211.000.

Kritzler, Gerhard; and Eckert, Paul, to Apparatebau Rothemuhle Brandt & Kritzler. Regenerative air preheater for separate preheating of two or more air-or gas streams. 4,114,680, Cl. 165-4.000.

Krogmann, Uwe, to Bodenseewerk. Navigation instrument for the navigation of land vehicles. 4,114,437, Cl. 73-178.00R.

Krol, Vladimir Alexandrovich: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Kropacheva, Elena Nikolaevna: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna, Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Kropp, James E.: *See*—
Robins, Janis; Kropp, James E.; and Young, Chung I., 4,115,295, Cl. 528-90.000.

Krumpelt, Michael, to BASF Wyandotte Corporation. Method of electrolyzing brine. 4,115,218, Cl. 204-98.000.

Kubens, Rolf; and Meyer, Frank, to Bayer Aktiengesellschaft. Process for the consolidation of geological formations and loosened rock and earth masses. 4,114,382, Cl. 405-264.000.

Kubitza, Kar-Heinz: *See*—
Otte, Wilhelm; Bergmann, Gunther; and Kubitza, Kar-Heinz, 4,115,265, Cl. 210-68.000.

Kubo, Daijiro; and Hashimoto, Masaru, to Tokyo Shibaura Electric Co., Ltd. MOS IC Oscillation circuit. 4,115,748, Cl. 331-111.000.

Kubota Ltd.: *See*—
Yano, Naomichi, 4,115,501, Cl. 264-133.000.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,115,476, Cl. 260-880.00R.

Kubota, Yuichi; and Kajimoto, Norifumi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,115,290, Cl. 252-62.540.

Kubotera, Kikuo; Kashiwabara, Akira; and Sato, Kotaro, to Fuji Photo Film Co., Ltd. Process for production of printing plate. 4,115,118, Cl. 96-33.000.

Kuboyama, Hisaharu: *See*—
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.

Kuchenbecker, Dietrich: *See*—
Kleineisel, Gustav; Kuchenbecker, Dietrich; and Ahrens, Gerd, 4,115,033, Cl. 417-216.000.

Kuczkowski, Thomas A.: *See*—
Jenis, Donald S.; Kuczkowski, Thomas A.; Mazer, Jack S.; and Westerkamp, Douglas F., 4,114,684, Cl. 165-82.000.

Kudlich, Hans; and Schweitzer, Karl, to Maschinenfabrik Peter Zimmer Aktiengesellschaft. Control system for rotary printing screens. 4,114,534, Cl. 101-115.000.

Kudo, Yoshiaki: *See*—
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.

Kuhlthau, Hans-Peter: *See*—
Raue, Roderich; Eifler, Willi; and Kuhlthau, Hans-Peter, 4,115,413, Cl. 260-390.000.

Kuhn, Margrit. Foot rest. 4,114,613, Cl. 128-80.00R.

Kuhnel, Werner: *See*—
Hohmann, Walter; and Kuhnel, Werner, 4,115,412, Cl. 260-380.000.

Kukolja, Stjepan; and Spry, Douglas O., to Eli Lilly and Company. Process for 3-chloro cephalosporins. 4,115,643, Cl. 544-16.000.

Kulabukhov, Vadim Alexandrovich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Kulite Semiconductor Products, Inc.: *See*—
Brosh, Amnon; and Geiger, Dana F., 4,115,767, Cl. 340-347.0CC.

Kulkarni, Avinash D.; and Cleary, James G., to Westinghouse Electric Corp. Processing of ammonium paratungstate from tungsten ores. 4,115,513, Cl. 423-56.000.

Kulzer & Co. GmbH: *See*—
Gross, Albert; and Schaefer, Roland, 4,115,346, Cl. 260-42.150.

Kulzer, Friedhelm; and Mayer, Ehrhard. Cooled mechanical seal. 4,114,899, Cl. 277-22.000.

Kunieda, Naoshi: *See*—
Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, 4,115,117, Cl. 96-29.00D.

Kuniko Saita: *See*—
Oyama, Shoji, 4,114,916, Cl. 280-47.290.

Kuninaka, Akira: *See*—
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, 4,115,538, Cl. 424-1.000.

Kunkele, Rudolf; and Engelhardt, Hans-Peter, to Magnesital-Feuerfest GmbH. Unburnt refractory masses or bricks for metallurgical vessels based on chrome-ore and carbon-containing binder. 4,115,133, Cl. 106-56.000.

Kurahashi, Takashi: *See*—
Inagaki, Mitsuo; Sasaya, Hideaki; and Kurahashi, Takashi, 4,115,030, Cl. 416-93.00R.

Kurata, Sakae: *See*—
Kato, Hideo; Koshinaka, Eiichi; Kurata, Sakae; and Uesaka, Ikuo, 4,115,392, Cl. 260-295.50R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Otani, Sugio; Watanabe, Shoji; and Araki, Tadashi, 4,115,527, Cl. 423-447.400.

Kurfman, Virgil B.; and Gransden, Raymond E., Jr., to Dow Chemical Company, The. Highly reflective multilayer metal/polymer composites. 4,115,619, Cl. 428-336.000.

Kuris, Alexandr Pavlovich: *See*—
Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich, 4,114,415, Cl. 72-214.000.

Kurmeier, Hans-Adolf: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,115,456, Cl. 260-613.00R.

Kurtz, Roman: *See*—
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, 4,115,202, Cl. 202-99.000.

Kutami, Toshio: *See*—
Tsukamoto, Takeo; Okamura, Miyoshi; and Kutami, Toshio, 4,115,211, Cl. 204-37.00R.

Kuwakado, Satoshi: *See*—
Kasagi, Takao; Kuwakado, Satoshi; and Takei, Toshihiro, 4,114,924, Cl. 280-740.000.

Kuznetsov, Andrei Vasilievich: *See*—
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Kvita, Vratislav: *See*—
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,115,231, Cl. 204-159.220.
Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, 4,115,359, Cl. 528-170.000.

Kymmell, Georg Rudolph Wolter: *See*—
Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and De Haan, Friedrich Jacobus, administrator, 4,114,406, Cl. 68-24.000.

L.A. & E.W. Tunnicliffe Limited: *See*—
Tunnicliffe, Leonard Alfred, 4,114,884, Cl. 273-106.50C.

L. Eschweiler & Co.: *See*—
Huch, Albert; and Lubbers, Dietrich Werner, 4,114,602, Cl. 128-2.00E.

L. Schuler GmbH: *See*—
Braun, Hans; Cieslok, Gunter; and Wolf, Franz, 4,114,490, Cl. 83-303.000.
Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, 4,114,489, Cl. 83-298.000.

La Barge, Inc.: *See*—
Creach, Wally E., 4,114,447, Cl. 73-362.0AR.

La Cellophane: *See*—
Quang, Pham Kim; and Marckmann, Jean-Claude, 4,115,114, Cl. 96-1.400.

La Telemecanique Electrique: *See*—
Bernard, Pierre Jean, 4,114,848, Cl. 248-346.000.

Labaz: *See*—
Nanthavong, Souli; Pigerol, Charles; Eymard, Pierre; and Simiand, Jacques, 4,115,401, Cl. 260-326.430.

Labbe, Francis Auguste Maurice; and Hirsh, Ivan Yehudi, to Molins Limited. Cigarette-making machines. 4,114,631, Cl. 131-84.00C.

Labeye-Voisin, Gerard Francois; and Hostein, Claude, to Compagnie Internationale pour l'Informatique Cil Honeywell Bull. Interfaces for connecting a data-processing unit to a working station. 4,115,856, Cl. 364-200.000.

Laboratorios del Dr. Esteve, S.A.: *See*—
Esteve-Subirana, Antonio, 4,115,648, Cl. 544-110.000.

Lachinov, Evgeny Alexandrovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Lacroix, Guy; Debourge, Jean-Claude; and Ducret, Jacques, to Philagro S.A. Diphosphorus derivatives and fungicidal compositions containing them. 4,115,559, Cl. 424-209.000.

Laface, Carmelo; and Vantellini, Carlo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Discriminating network for telephone switching signals. 4,115,664, Cl. 179-84.00R.

Lafeber, Andre, to Imperial Chemical Industries Limited. Yarn winding apparatus. 4,114,820, Cl. 242-18.00A.

Laine, Buddy. Reminder system. 4,115,846, Cl. 364-200.000.

Laird, Richard Alan; and Burnham, Geoffrey Desmond. Ski pole. 4,114,911, Cl. 280-11.37F.

Lalande, Jacques Alfred; and Thevin, Rene Roger, to International Standard Electric Corporation. Error compensating phase-locked loop. 4,115,743, Cl. 331-14.000.

Lalezari, Iraj: *See*—
Shafiee, Ali; Lalezari, Iraj; and Yassa, Narges, 4,114,314, Cl. 47-85.000.

Lam, Hsiao Ling; and Teach, Eugene G., to Stauffer Chemical Company. Certain formamidine dithiophosphates and phosphonates and their use as insecticides. 4,115,556, Cl. 424-200.000.

Lam, Hsiao Ling; and Teach, Eugene G., to Stauffer Chemical Company. Certain formamidine dithiophosphates and phosphonates and their use as insecticides. 4,115,560, Cl. 424-211.000.

Lam, Hsiao-Ling; and Pallos, Ferenc M., to Stauffer Chemical Company. N-1,1,2,2-tetrachloro-2-fluoroethylthio benzanilide and its use as fungicide and acaricide. 4,115,582, Cl. 424-298.000.

Lambert, Glen I.: *See*—
Lehman, Leon M.; and Lambert, Glen I., 4,115,247, Cl. 208-62.000.

Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines. Platform structure for maritime installations. 4,114,392, Cl. 405-207.000.

Landstorfer, Friedrich: *See*—
Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, 4,114,623, Cl. 128-303.140.

Lang, Stanley Albert, Jr.; and Walworth, Bryant Leonidas, to American Cyanamid Company. Pyrazolyltriazole herbicides. 4,115,097, Cl. 71-92.000.

Lange, Heinz. Windmill rotor. 4,115,032, Cl. 416-227.00A.

Lange, Kai; Toefting, Verner; Wiesen, Ernest J.; and Lijewski, Robert R., to General Electric Company. Scintillation camera system with improved means for correcting nonuniformity in real time. 4,115,694, Cl. 250-363.00S.

Lange, Michael: *See*—
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 4,115,261, Cl. 210-40.000.

Langenegger, Werner: *See*—
Realini, Enrico; and Langenegger, Werner, 4,114,706, Cl. 177-70.000.

Langenfeld, Michel, to Pont-A-Mousson S.A. Large-diameter insulated pipe. 4,114,657, Cl. 138-109.000.

Langeron, Jean-Paul: *See*—
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,115,113, Cl. 75-206.000.

Langfield, Edward R.; Hile, James L.; and Hird, David L., to Edward R. Langfield. Hydraulically actuated tool for mechanically splitting rock-like material. 4,114,951, Cl. 299-22.000.

Langlois, Etienne: *See*—
Ernyei, Herbert; and Langlois, Etienne, 4,114,454, Cl. 73-579.000.

Langsford, Stephen Walter, to Overseas Containers Australia Pty Limited. Clamp. 4,115,020, Cl. 403-322.000.

Lantos, Ivan: *See*—
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,115,642, Cl. 536-121.000.

Laporte Industries Limited: *See*—
Chambers, Hubert Harold; and Tear, Brian John, 4,115,144, Cl. 106-300.000.

Large, Michael Stewart; and Smith, Leslie Harold, to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,115,409, Cl. 260-347.300.

Larsen, Ebbe: *See*—
Schjelde, Ole Mikel; and Larsen, Ebbe, 4,115,039, Cl. 417-363.000.

Larsen, Ole Fjord. Apparatus for preventing erosion of the seabed in front of hydraulic structures. 4,114,394, Cl. 405-25.000.

Larson, Louis A.: *See*—
Jensen, Gerald A.; Larson, Louis A.; and Diesch, Robert E., 4,114,349, Cl. 53-54.000.

Larsson, Karl-Georg; and Norell, Maria, to Kemanord AB; Kemanord AB; and Kemanord AB. Process for electrolytic preparation of chlorites. 4,115,217, Cl. 204-95.000.

Latassa, Frank M., to GTE Sylvania Incorporated. Method of processing fluorescent lamp. 4,114,968, Cl. 316-1.000.

Lauria, Francesco: *See*—
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.

LaVene, Leon F., to Schmelzer Corporation. Method and apparatus for making metal parts. 4,114,417, Cl. 72-379.000.

Lawrence, George J., to General Electric Company. Dust shield for cap and connector. 4,114,974, Cl. 339-103.00C.

Lawrence, Robert Raymond. Prefabricated transportable building without continuous steel chassis. 4,114,328, Cl. 52-79.100.

Lawrimore, William T. Hazardous travel simulating game. 4,114,891, Cl. 273-250.000.

Laws, Arthur Ernest, to Trubenised (Sales) Limited. Tracer apparatus. 4,114,278, Cl. 33-23.00K.

Lawson, Nelson E., to Union Camp Corporation. Novel coating compositions. 4,115,330, Cl. 260-26.000.

Lazarus, Stanley David; and Chakravarti, Kalidas, to Allied Chemical Corporation. Production of thermally stabilized polyester. 4,115,350, Cl. 260-45.80A.

Le Joint Francais: *See—*
Mercier, Bernard, 4,114,905, Cl. 277-164.000.
Leach, Leslie Alan; Riddoch, Henry Jamieson; and Duffy, Neil David, to Pico Electronics Limited. Gramophone equipment. 4,114,893, Cl. 274-9.0RA.
Leasure, William R.: *See—*
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,114,563, Cl. 118-63.000.
LeClere, Jacques: *See—*
Habermann, Helmut; Brunet, Maurice; and LeClere, Jacques, 4,114,960, Cl. 308-10.000.
Lectric Lites Company: *See—*
Blaylock, Arnold O.; Falconer, Robert P.; and Campbell, Charles M., 4,114,789, Cl. 224-42.10E.
Lednicer, Daniel, to Upjohn Company, The. Compounds, compositions and method of use. 4,115,589, Cl. 424-330.000.
Lee, Alexander Y.: *See—*
Gershberg, David N.; Lee, Alexander Y.; and D'Orto, Michael D., 4,115,781, Cl. 343-768.000.
Lee, Frank: *See—*
Fearnley, Charles; Fordham, Glenda Helen; and Lee, Frank, 4,115,294, Cl. 252-106.000.
Lee, William W., Jr.: *See—*
Fort, William G. S.; and Lee, William W., Jr., 4,115,073, Cl. 23-293.00R.
Leeds & Northrup Company: *See—*
Hoopes, Howard Sherman; McClenahan, Robert William; Walsh, Thomas Joseph; and Zecca, James William, 4,115,785, Cl. 346-34.000.
Walsh, Thomas Joseph, 4,114,446, Cl. 73-362.0AR.
Leffler, Dennis Frank: *See—*
Jones, Arthur Lee; and Leffler, Dennis Frank, 4,114,275, Cl. 32-22.000.
Legleye, Andre Jules: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.
Lehman, Leon M.; and Lambert, Glen I., to Hydrocarbon Research, Inc. Benzene production by solvent extraction and hydrodealkylation. 4,115,247, Cl. 208-62.000.
Leistikow, Gerard K.: *See—*
Guerrero, Benjamin G.; Leistikow, Gerard K.; and Sindlinger, Norman E., 4,114,313, Cl. 46-264.000.
Leitert, Frederick C.: *See—*
Lemanski, Michael F.; Leitert, Frederick C.; and Vinson, Carl G., Jr., 4,115,323, Cl. 252-455.00R.
Lello, Diane L.; and Diamond, Barry S. Ski caddy. 4,114,915, Cl. 280-47.190.
Lemaire, Gilbert: *See—*
Dekeister, Roger; Lemaire, Gilbert; and Marzys, Daniel, 4,115,210, Cl. 204-10.000.
Lemanski, Michael F.; Leitert, Frederick C.; and Vinson, Carl G., Jr., to Diamond Shamrock Corporation. Catalyst and process for production of VCM. 4,115,323, Cl. 252-455.00R.
Leppard, David G.: *See—*
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,115,121, Cl. 96-56.300.
Lerg, George: *See—*
Nelson, David H., 4,115,177, Cl. 156-245.000.
Lerner, Sidney I., to Ethyl Corporation. Binuclear phenols for reducing plasma lipid levels. 4,115,590, Cl. 424-337.000.
Lesieur, Jean-Paul, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Apparatus for monitoring evolutive information. 4,115,818, Cl. 360-5.000.
Lesser, Joseph H.: *See—*
Oswald, Alexis A.; and Lesser, Joseph H., 4,115,482, Cl. 260-957.000.
L'Etat Francais, Represente par le Secretaire d'Etat aux Postes et Telecommunications: *See—*
Guinet, Yves Maurice; and Noirel, Yves Maurice, 4,115,662, Cl. 179-15.0BV.
Letourneur, Pierre: *See—*
Dewitte, Jean; and Letourneur, Pierre, 4,115,504, Cl. 264-221.000.
Lettine Anthony: *See—*
Lettine, Howard J.; and Lettine Anthony, 4,114,514, Cl. 91-211.000.
Lettine, Howard J.; and Lettine Anthony. Oscillating steam engines. 4,114,514, Cl. 91-211.000.
Lever Brothers Company: *See—*
Moran, David Patrick Joseph, 4,115,598, Cl. 426-604.000.
Levine, Alexander M.; and Ramsey, Henry R., to Webster Spring Co. Inc. Spring assembly with reinforcement. 4,114,210, Cl. 5-260.000.
Levine, Alexander M.; Ramsey, Henry R.; and Martin, Robert T., to Webster Spring Co. Inc. Corner stiffener. 4,114,211, Cl. 5-261.000.
Levine, Isaac Jacob: *See—*
Brown, Gary Leigh; Cummings, Weldon Clifford; and Levine, Isaac Jacob, 4,115,639, Cl. 526-130.000.
Levine, Jules David, to RCA Corporation. Device having thermionic cathode heated by field-emitted electrons. 4,115,720, Cl. 313-337.000.
Levit, Maxim Lvovich: *See—*
Padalko, Oleg Vadimovich; Levit, Maxim Lvovich; and Voinov, Nikolai Vasilievich, 4,115,623, Cl. 428-566.000.
Lewis, Meirion Francis, to National Research Development Corporation. Programable frequency acoustic wave discriminator. 4,115,744, Cl. 331-16.000.
Lewis, Peter Frederick: *See—*
Brady, Michael Barry; and Lewis, Peter Frederick, 4,115,746, Cl. 331-90.000.
Lewyn, Lanny Louis; and Simpson, Glen David, to American Hospital Supply Corporation. Cardiac pacer system and method with capture verification signal. 4,114,627, Cl. 128-419.0PT.
Leybold-Heraeus GmbH & Co. KG: *See—*
Kienel, Gerhard; and Petersein, Helmut, 4,115,653, Cl. 13-31.000.
Libsch, Karl David; and Rao, Mannige Vikram, to N L Industries, Inc. Secondary lead smelting process. 4,115,109, Cl. 75-77.000.
Licentia Patent-Verwaltungs-GmbH: *See—*
Wolf, Otto, 4,114,699, Cl. 173-109.000.
Lieber, Derek: *See—*
Weinstock, Jacques; Lieber, Derek; and Hay, William Dunning, 4,115,690, Cl. 250-308.000.
Liebeskind, Arthur S. Adjustable configuration toy. 4,114,307, Cl. 46-1.00R.
Liepold, August, to AGFA-Gevaert AG. Magnetic tape cassette. 4,114,833, Cl. 242-199.000.
Liermann, Traugott: *See—*
Mischo, Klaus; and Liermann, Traugott, 4,115,000, Cl. 355-29.000.
Mischo, Klaus; Liermann, Traugott; and Pustka, Karel, 4,115,001, Cl. 355-29.000.
Lijewski, Robert R.: *See—*
Lange, Kai; Toefting, Verner; Wiesen, Ernest J.; and Lijewski, Robert R., 4,115,694, Cl. 250-363.00S.
Lilly Industries Limited: *See—*
Chakrabarti, Jiban Kumar; and Tupper, David Edward, 4,115,568, Cl. 424-250.000.
Chakrabarti, Jiban Kumar; and Tupper, David Edward, 4,115,574, Cl. 424-250.000.
Lincklaen Arriens, Jan: *See—*
Van Steveninck, Johannes; and Lincklaen Arriens, Jan, 4,114,390, Cl. 405-163.000.
Lindbom, Torsten H., to Unimation. Portable, programmable manipulator apparatus. 4,115,684, Cl. 219-124.220.
Lindburg, Norman Lee: *See—*
Catanese, Carmen Anthony; Harrison, James Berkeley, Jr.; and Lindburg, Norman Lee, 4,115,719, Cl. 313-105.00R.
Linde Aktiengesellschaft: *See—*
Kleineisel, Gustav; Kuchenbecker, Dietrich; and Ahrens, Gerd, 4,115,033, Cl. 417-216.000.
Lindemann, Martin K., to Chas. S. Tanner Co. Vinyl ester aqueous adhesive emulsions including allyl carbamate. 4,115,306, Cl. 260-17.00A.
Linden-Alimak AB: *See—*
Kohler, Ulf, 4,114,729, Cl. 187-29.00R.
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Lead dosing valve. 4,114,649, Cl. 137-625.190.
Lindenmeier, Heinz: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, 4,114,623, Cl. 128-303.140.
Lindquist, Terry Kent, to Borg-Warner Corporation. Fabricated pressure plate. 4,114,741, Cl. 192-89.00B.
Linhart, Karl; and Friedrich, Adolf, to Bayer Aktiengesellschaft. Process for the preparation of amino-nitrophenols. 4,115,652, Cl. 568-706.000.
Link, Otmar; and Nied, Gerhard, to AZO-Maschinenfabrik Adolf Zimmermann. Silo for bulk materials with fluidizing means. 4,114,324, Cl. 52-2.000.
Lipowski, Edwin M.: *See—*
Fischer, Donald A.; Lipowski, Edwin M.; and Kalt, William E., 4,114,507, Cl. 85-41.000.
Lipperts, Joseph H. F. G., to Hazemeijer B. V. Vacuum switch and electro-magnetic coil assembly therefor. 4,115,672, Cl. 200-144.00B.
Lipshield, Eugene C., to Orscheln Brake Lever Mfg. Company. Locking hook and pin apparatus for locking together a pair of components. 4,114,718, Cl. 180-89.140.
List, Hans: *See—*
Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, 4,114,714, Cl. 180-54.00A.
Lista, Edwin L.; Hartupee, Richard B.; Manfred, Ralph K.; and O'Neil, Paul L., to Aerojet-General Corporation. Coated ammonium perchlorate. 4,115,166, Cl. 149-7.000.
Litchford, George B., to Litchstreet Co. Passive ATCRBS using signals of remote SSR. 4,115,771, Cl. 343-6.00R.
Litchstreet Co.: *See—*
Litchford, George B., 4,115,771, Cl. 343-6.00R.
Litman, Alan, to Smith & Wesson Chemical Company, Inc. Mounting arrangement for a rifle scope. 4,114,302, Cl. 42-1.0ST.
Litton Systems, Inc.: *See—*
Craig, Robert J. C.; and Council, Clifton T., 4,114,402, Cl. 64-15.00B.
Hutchings, Thomas J.; and Sanders, Virgil E., 4,115,004, Cl. 356-106.0LR.
Litzenberg, David P. Motor driven pump. 4,115,038, Cl. 417-357.000.
Liu, Shing-Gong, to RCA Corporation. Fast-switching pulse modulator. 4,115,708, Cl. 307-268.000.
Lobeck, Walter G., Jr.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 4,115,571, Cl. 424-248.560.

Lobo, Edward: *See—*
Robinson, William M.; and Lobo, Edward, 4,115,834, Cl. 361-318.000.
Loch, George N. Implement attachment to shank. 4,115,021, Cl. 403-353.000.
Locher, Anton: *See—*
Bachhofer, Bruno; Locher, Anton; Skirde, Gerhard; and Quistorff, Hansjorg, 4,115,267, Cl. 210-136.000.
Lochte, Glen E., to FMC Corporation. High force connecting mechanism. 4,114,928, Cl. 285-18.000.
Lockheed Electronics Co., Inc.: *See—*
Atwater, Jerrold Bradford, 4,115,860, Cl. 364-492.000.
Loeffler, Herbert H., to Ciba-Geigy Corporation. Spray dispenser with easily actuable mouthpiece. 4,114,811, Cl. 239-288.500.
Loeser, Julius A.: *See—*
Loeser, William J.; and Loeser, Julius A., 4,114,505, Cl. 85-1.00C.
Loeser, William J.; and Loeser, Julius A. Coatings and methods of application. 4,114,505, Cl. 85-1.00C.
Logan, Lawrence Joseph: *See—*
Gupta, Rakesh Kumar; Jurkiewitsch, George; and Logan, Lawrence Joseph, 4,115,620, Cl. 428-374.000.
Loibl, Lorenz; and Scheurecker, Werner, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement for introducing a flexible starter bar into a continuous casting plant. 4,114,679, Cl. 164-426.000.
Lokalov, Anatoly Ivanovich: *See—*
Mukhamedyarov, Rashid Mustafievich; Smirnov, Boris Andreevich; Sery, Stanislav Vasilievich; Titkova, Tatyana Dmitrievna; and Lokalov, Anatoly Ivanovich, 4,115,272, Cl. 210-266.000.
Long, Clyde A. Fence rail connector. 4,114,861, Cl. 256-67.000.
Loomis, Phillip Eugene; Martz, Paul Elwood; and Phillips, Howard Charles, to AMP Incorporated. Application for terminals in strip form. 4,114,253, Cl. 29-566.200.
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, to Carl Still, Firma; and Rheinische Braunkohlenwerke Aktiengesellschaft. Apparatus for producing non-abrasive coke forms from brown-coal briquets. 4,115,202, Cl. 202-99.000.
Lormeau, Jean-Claude; Goulay, Jean; and Vairel, Edmond, to Choay S.A. Compounds of the plasminogen type and method for obtaining such compounds from placental pulps. 4,115,551, Cl. 424-105.000.
Losinger AG: *See—*
Luthi, Kurt, 4,114,242, Cl. 24-115.00R.
Lotz, Robert William: *See—*
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, 4,115,816, Cl. 358-283.000.
Lou, Perry W., to Texas Instruments Incorporated. Substrate bias for MOS integrated circuit. 4,115,710, Cl. 307-304.000.
Lowell, Arthur C., to Wordsmith, Inc. Hand-held data processing terminal. 4,115,870, Cl. 364-900.000.
Lowrey, Dean R.: *See—*
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,114,983, Cl. 350-164.000.
Lubbers, Dietrich Werner: *See—*
Huch, Albert; and Lubbers, Dietrich Werner, 4,114,602, Cl. 128-2.00E.
Lucas, Anthony James: *See—*
Degen, Peter John; and Lucas, Anthony James, 4,115,547, Cl. 424-60.000.
Lucas Industries Limited: *See—*
Beech, Keith James William, 4,114,258, Cl. 29-596.000.
Luchi, Alfred: *See—*
Jager, Albert; Lucht, Alfred; and Munch, Gerhard, 4,114,864, Cl. 266-51.000.
Luciani, Luciano: *See—*
Scata, Umberto; Luciani, Luciano; and Barbe, Pier Camillo, 4,115,319, Cl. 252-429.00B.
Luepertz, Hans-Henning; and Fischenich, Bernhard, to ITT Industries, Inc. Brake system tester. 4,114,430, Cl. 73-121.000.
Lukashov, Anatoly Ivanovich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Lundh, Roy W., to Poseidon Marketing and Development Co. Positive flow estuary structure. 4,114,381, Cl. 405-94.000.
Lunetta, Donald M. Navigational device. 4,114,997, Cl. 353-11.000.
Lunsford, Carl D.; and Cale, Albert D., Jr., to A. H. Robins Company, Inc. Fatty acid amides of norfenfluramine and compositions and methods thereof. 4,115,587, Cl. 424-324.000.
Luo, Fang-Chen, to Westinghouse Electric Corp. Thin film copper transition between aluminum and indium copper films. 4,115,799, Cl. 357-71.000.
Luteran, Frank K. Visual test indicator for ignition systems. 4,115,758, Cl. 340-52.00R.
Luthi, Kurt, to Losinger AG. Cable grip gripping apparatus. 4,114,242, Cl. 24-115.00R.
Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Guide shoes. 4,114,945, Cl. 296-137.00E.
Lutz, Peter M., to Parlec, Inc. Suspension system for wheel of a motor bike. 4,114,918, Cl. 280-284.000.
Lvov, Jury Alexandrovich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Lykin, Anatoly Sergeevich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Lyle, Judge M.; and Eberle, Jon W. Traction device. 4,114,611, Cl. 128-75.000.
Lyon, Harriette: *See—*
Lyon, Irving; and Lyon, Harriette, 4,115,313, Cl. 252-309.000.
Lyon, Irving; and Lyon, Harriette. Bile acid emulsions. 4,115,313, Cl. 252-309.000.
Lyshkow, Norman A., to Combustion Equipment Associates Inc. Pollution monitoring apparatus. 4,115,067, Cl. 422-56.000.
MacAfee, Jerry D.; and Collette, Ronald J., to Jamesbury Corp. Valve seat insert. 4,114,856, Cl. 251-306.000.
MacBride, James J.: *See—*
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,115,836, Cl. 361-382.000.
MacFarland, Charles H., to Scott & Fetzer Company, The. Deflator-inflator attachment. 4,114,230, Cl. 15-330.000.
Macfee, Norman W., to Textron, Inc. Plasticizing and molding articles from polymer strip. 4,115,489, Cl. 264-23.000.
Machacek, Oldrich, to Atlas Powder Company. Hydrophobic aluminum sensitizing agents for explosives. 4,115,165, Cl. 149-5.000.
Mackie, Gordon John: *See—*
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, 4,115,548, Cl. 424-70.000.
MacLeish, William T.; and Shulman, Joseph, to Polaroid Corporation. Novel protective plastomeric sheet for identification card. 4,115,618, Cl. 428-204.000.
Macuga, Henry J.; and Deschamps, Bernard F., to Eclipse Mfg. Inc. Fixture hanging assembly. 4,114,326, Cl. 52-28.000.
Madsen, Per Johan: *See—*
Tankred, Hans Jurgen; and Madsen, Per Johan, 4,115,035, Cl. 417-312.000.
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., to Minnesota Mining and Manufacturing Company. Polymeric optical element having antireflecting surface. 4,114,983, Cl. 350-164.000.
Magnesital-Feuerfest GmbH: *See—*
Kunkele, Rudolf; and Engelhardt, Hans-Peter, 4,115,133, Cl. 106-56.000.
Magri, Antonio, to G. H. Endress & Co. Method and apparatus for measuring the height of filling material on a surface, such as within a container. 4,114,441, Cl. 73-290.00V.
Mahaffy & Harder Engineering Co.: *See—*
Mahaffy, Reid A.; and Hamilton, Joel A., 4,114,348, Cl. 53-433.000.
Mahaffy, Reid A.; and Hamilton, Joel A., to Mahaffy & Harder Engineering Co. Packaging techniques for semi-rigid packages. 4,114,348, Cl. 53-433.000.
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Mahoney, Fred G.: *See—*
Harpman, Webster B.; and Mahoney, Fred G., 4,114,566, Cl. 123-25.00B.
Mahoney, Robert D.; and Schneider, Stephen E., to Dow Chemical Company, The. Process for preparing microporous polyethylene hollow fibers. 4,115,492, Cl. 264-49.000.
Maier, Albin, to Snap-Tite, Inc. Cable reel valve and system. 4,114,827, Cl. 242-86.510.
Maiocchi, Luigi; and Silva, Luigi, to Industrie Pirelli S.p.A. Pneumatic tire for vehicles having improved handling and road gripping. 4,114,671, Cl. 152-209.00R.
Makino, Nobuo: *See—*
Kinoshita, Hirotugu; Sekiya, Makoto; and Makino, Nobuo, 4,115,284, Cl. 252-29.000.
Makita, Tomoo: *See—*
Fujimoto, Isao; Aiba, Masahiko; Yamamoto, Yoichi; and Makita, Tomoo, 4,115,787, Cl. 346-75.000.
Maklad, Mokhtar S.: *See—*
Asam, Adolf R.; and Maklad, Mokhtar S., 4,114,980, Cl. 350-96.330.
Malan, Mabel. Disposable bib tray. 4,114,199, Cl. 2-49.00A.
Malata, Peter; and Buchsteiner, Josef, to Dentalwerk Burmoos Gesellschaft m.b.H. Dental tool handpiece assembly with removable spacer member. 4,114,276, Cl. 32-26.000.
Malec, Jerry P. Oil reclaimer. 4,115,201, Cl. 196-46.100.

Malherbe, Marie Jeanne Francoise Louise Ghislaine: *See—*
Janssens, Juliaan Leo Gerard; and Malherbe, Marie Jeanne Francoise Louise Ghislaine, 4,115,866, Cl. 364-900.000.
Malish Brush & Specialty Company: *See—*
Malish, Terrance J.; and Hulin, Martin J., 4,114,225, Cl. 15-230.170.
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Malo, Lowell L., to ACF Industries, Incorporated. Box car anti-pilferage device. 4,114,935, Cl. 292-104.000.
Maloney, James Francis, Jr., to Du Pont de Nemours, E. I., and Company. Protective package. 4,114,759, Cl. 206-523.000.
Manabe, Takao; and Matunaga, Sigetugu, to Toshiba Kikai Kabushiki Kaisha. Automatic sewing machines. 4,114,545, Cl. 112-121.150.
Manchand, Percy, to Hoffmann-La Roche Inc. Process for preparing 2,4-diamino-5-(substituted benzyl)-pyrimidines. 4,115,650, Cl. 544-324.000.
Manfred, Ralph K.: *See—*
Lista, Edwin L.; Hartupee, Richard B.; Manfred, Ralph K.; and O'Neil, Paul L., 4,115,166, Cl. 149-7.000.
Manghisi, Elso; Salimbeni, Aldo; and Ferni, Giovanni, to Instituto Luso Farmaco d'Italia S.r.l. Esters of 1-(p-hydroxyphenyl)-2-(1'-methyl-2'-phenoxyethylamino)-1-propanol. 4,115,585, Cl. 424-311.000.
Manheimer, Wallace M.: *See—*
Ott, Edward; and Manheimer, Wallace M., 4,115,191, Cl. 176-3.000.
Manizza, Guelfo A., to Federal Paper Board Co., Inc. Tray type container. 4,114,797, Cl. 229-31.00R.
Mannesmann Aktiengesellschaft: *See—*
Grandin, Friedrich-Hans; Fritsch, Werner; and Wengenrod, Gunter, 4,115,685, Cl. 219-155.000.
Mansfield, Peter, to National Research Development Corporation. Nuclear magnetic resonance apparatus and methods. 4,115,730, Cl. 324-0.50A.
Mao, Chung-Ling, to Uniroyal, Inc. Substituted morpholine catalyst for polyurethane foam. 4,115,302, Cl. 521-115.000.
Maraschin, Norma Jean: *See—*
Karol, Frederick John; Wu, Chisung; Reichle, Walter Thomas; and Maraschin, Norma Jean, 4,115,425, Cl. 260-438.50R.
Marchak, Roman O.; and Drellishak, Glen J., to Bendix Corporation, The. Start enrichment circuit for internal combustion engine fuel control system. 4,114,570, Cl. 123-32.0EG.
Marchand, Joseph; and Puig, Jean-Rene, to Commissariat a l'Energie Atomique. Method of fabrication of porous macromolecular materials having an internal lining and materials obtained by means of said method. 4,115,303, Cl. 521-53.000.
Marchio, John P.; and Figueredo, Hector. Price label remover. 4,114,267, Cl. 30-172.000.
Marckmann, Jean-Claude: *See—*
Quang, Pham Kim; and Marckmann, Jean-Claude, 4,115,114, Cl. 96-1.400.
Marcus, Konrad H., to Prince Corporation. Reversible side mount mirror. 4,114,986, Cl. 350-282.000.
Margres, Jack J.: *See—*
Rubino, Andrew M.; and Margres, Jack J., 4,115,553, Cl. 424-155.000.
Marinelli, Nicola, to NCR Corporation. Pearlescent capsules and process for their preparation. 4,115,315, Cl. 252-316.000.
Marion, Jacques; and Pralus, Christian, to Produits Chimiques Ugine Kuhlmann. Catalysts and processes for preparing unsaturated nitriles. 4,115,434, Cl. 260-465.300.
Mark, Victor; and Hoogebroom, Thomas J., to General Electric Company. Flame retardant polycarbonate composition. 4,115,354, Cl. 260-45.70S.
Marmer, Melvin. Arithmetic teaching device. 4,114,294, Cl. 35-31.00C.
Marrs, Oren L.: *See—*
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., 4,115,335, Cl. 260-28.5AS.
Marsh, Dana G., to Xerox Corporation. Crystallization of selenium in polymer matrices via in situ generation of organic crystalline nucleation sites. 4,115,115, Cl. 96-1.50R.
Marsh, Frank Dennis, to Du Pont de Nemours, E. I., and Company. N-cyanoaziridines. 4,115,384, Cl. 260-239.00E.
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, to Procter & Gamble Company, The. Detergent compositions comprising modified proteins. 4,115,548, Cl. 424-70.000.
Martin, Chloeta F.: *See—*
Martin, Theodore O., Jr., 4,115,614, Cl. 428-220.000.
Martin, David Joseph, to BICC Limited. Optical fibres. 4,115,087, Cl. 65-3.00C.
Martin, Frank Eugene; and Rich, Edward Larmour, III, to Midori Anzen Company, Ltd. Sequential ignition system for oxygen generation elements. 4,115,069, Cl. 422-112.000.
Martin Processing, Inc.: *See—*
Hermes, Julius, 4,115,054, Cl. 8-17.000.
Martin, Robert T.: *See—*
Levine, Alexander M.; Ramsey, Henry R.; and Martin, Robert T., 4,114,211, Cl. 5-261.000.
Martin, Theodore O., Jr., to Martin, Chloeta F., a part interest. Bonding layers for lining articles with a chlorinated polyethylene material. 4,115,614, Cl. 428-220.000.
Martynova, Marina Alexandrovna: *See—*
Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,468, Cl. 260-683.15D.
Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,469, Cl. 260-683.15D.
Martz, Paul Elwood: *See—*
Loomis, Phillip Eugene; Martz, Paul Elwood; and Phillips, Howard Charles, 4,114,253, Cl. 29-566.200.
Maruszak, John E. Pool table golf game. 4,114,876, Cl. 273-87.00B.
Maruyama, Takeshi: *See—*
Kosaka, Kimito; Umehara, Kunio; and Maruyama, Takeshi, 4,115,814, Cl. 358-243.000.
Maruyama, Yasuo: *See—*
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,532, Cl. 423-492.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,533, Cl. 423-492.000.
Marzys, Daniel: *See—*
Dekeister, Roger; Lemaire, Gilbert; and Marzys, Daniel, 4,115,210, Cl. 204-10.000.
Maschienefabrik Memmingen KG. Ing. Theodor Otto: *See—*
Thoma, Georg; and Muller, Hans, 4,114,821, Cl. 242-43.00R.
Maschinenfabrik Peter Zimmer Aktiengesellschaft: *See—*
Kudlich, Hans; and Schweitzer, Karl, 4,114,534, Cl. 101-115.000.
Mascioli, Rocco L.: *See—*
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,115,634, Cl. 521-126.000.
Mash, Derek H.; Crossland, William A.; and Morrissy, Joseph H., to International Standard Electric Corporation. Liquid crystal rotator. 4,114,990, Cl. 350-337.000.
Massachusetts Institute of Technology: *See—*
Henrich, Victor E.; and Fan, John C. C., 4,115,228, Cl. 204-192.0EC.
Pratt, George W., Jr., 4,115,280, Cl. 250-527.000.
Masuda, Senichi. Electrostatic powder painting apparatus. 4,114,810, Cl. 239-15.000.
Masuda, Tetsuzo; Tagawa, Tomiyasu; Yoshioka, Hachiro; and Akahoshi, Takashi, to Nissan Motor Company, Limited. Catalytic converter having improved supporting members for monolithic catalyst. 4,115,071, Cl. 422-179.000.
Masuoka, Fujio; and Iizuka, Hisakazu, to Tokyo Shibaura Electric Co., Ltd. Semiconductor memory device. 4,115,795, Cl. 357-24.000.
Matson, Lawrence Wayne, Jr.; Nixon, Jeddy Darr, Jr.; and Remont, Larry Joseph, to Maurer Engineering Inc. Well drilling tool having sealed lubrication system. 4,114,703, Cl. 175-107.000.
Matsuda, Munekazu, to Kawasaki Jukogyo Kabushiki Kaisha. Internal combustion engine. 4,114,371, Cl. 60-282.000.
Matsuda, Munekazu; and Sakaue, Yoshiaki, to Kawasaki Jukogyo Kabushiki Kaisha. Fuel-air mixture feed device of the multiple cylinder and multiple carburetor type for an internal combustion engine. 4,114,572, Cl. 123-59.0PC.
Matsuda, Yoshinobu; Suzuki, Yukio; and Yasui, Seimei, to Sumitomo Chemical Company, Limited. Sulfonated product of butadiene or isoprene oligomer and the production therefor. 4,115,437, Cl. 260-513.00R.
Matsunaga, Mitsushi: *See—*
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.
Matsuo, Katsuharu: *See—*
Yamamura, Hideo; Matsuo, Katsuharu; and Nagai, Nobuyuki, 4,115,677, Cl. 219-10.49R.
Matsuoka, Shinji: *See—*
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, 4,115,761, Cl. 340-146.3AC.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hayashi, Yoshiaki; and Fujimori, Nobuyoshi, 4,115,825, Cl. 360-85.000.
Minakuchi, Hiroshi, 4,115,831, Cl. 361-236.000.
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,115,739, Cl. 330-263.000.
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.
Matsuura, Eiichi; Takahashi, Keikichi; Tsukada, Nobuo; and Tatsumi, Yoshio, to Kabushiki Kaisha Daini Seikosha. Battery lead plate member for an electronic wrist watch. 4,114,365, Cl. 58-23.0BA.
Matsuura, Tamiaki: *See—*
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.
Mattel, Inc.: *See—*
Gay, Derek John, 4,114,309, Cl. 46-75.000.
Guerrero, Benjamin G.; Leistikow, Gerard K.; and Sindlinger, Norman E., 4,114,313, Cl. 46-264.000.
Kimmell, Steven Donald, 4,114,952, Cl. 301-5.700.
Schroeder, Robert Frederich, 4,115,042, Cl. 417-479.000.
Matthias, Heinz-Bernd: *See—*
Florjancic, Dusan; and Matthias, Heinz-Bernd, 4,115,029, Cl. 415-211.000.
Mattila, Alvin J. Appliance for swimmers. 4,114,874, Cl. 272-71.000.
Matula, Jouni: *See—*
Paakkinen, Ilmari; Hakkinen, Seppo; and Matula, Jouni, 4,114,818, Cl. 241-244.000.
Matunaga, Sigetugu: *See—*
Manabe, Takao; and Matunaga, Sigetugu, 4,114,545, Cl. 112-121.150.

Matzkin, Leonid Arkadjevich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Mau, Theodore A., to Runte, Robert Ralph. Variable velocity control for playing images for a manually controlled electronic video display game. 4,114,882, Cl. 273-85.00G.

Maurer Engineering Inc.: *See—*
Matson, Lawrence Wayne, Jr.; Nixon, Jeddy Darr, Jr.; and Remont, Larry Joseph, 4,114,703, Cl. 175-107.000.
Maurer, William C.; McDonald, William J., Jr.; and Ward, Charles E., 4,114,702, Cl. 175-107.000.
Maurer, William Casper; Sinclair, Albert Richard; and McDonald, William Jesse, Jr., 4,114,704, Cl. 175-107.000.

Maurer, Fritz; Riebel, Hans-Jochem; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-Alkyl-O-(6-alkanesulphonyloxy-pyrimidin(4)yl)-(thiono) (thiol) phosphoric (phosphonic) acid esters and ester-amides and arthropodicidal compositions and methods of combating arthropods using them. 4,115,542, Cl. 424-200.000.

Maurer, William C.; McDonald, William J., Jr.; and Ward, Charles E., to Maurer Engineering Inc. Well drilling tool with lubricant level indicator. 4,114,702, Cl. 175-107.000.

Maurer, William Casper; Sinclair, Albert Richard; and McDonald, William Jesse, Jr., to Maurer Engineering Inc. Down hole well drilling tool with reversible thrust bearings. 4,114,704, Cl. 175-107.000.

Mauritzon, Rune. Continuous vulcanization of rubber. 4,115,511, Cl. 264-347.000.

Maximovsky, Sergei Nikolaevich: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Maxson, Orwin G.; and Achenbach, Gary D., to Continental Oil Company. Method for retarding scale formation. 4,115,606, Cl. 427-386.000.

Mayer, Ehrhard: *See—*
Kulzer, Friedhelm; and Mayer, Ehrhard, 4,114,899, Cl. 277-22.000.

Mayer, Joseph; and Sherlock, Margaret H., to Schering Corporation. 1-Aminonaphthyridines. 4,115,395, Cl. 260-296.00N.

Mayhew, Michael R.: *See—*
Joynt, Gerald E.; and Mayhew, Michael R., 4,114,944, Cl. 296-50.000.

Mazer, Jack S.: *See—*
Jenis, Donald S.; Kuczkowski, Thomas A.; Mazer, Jack S.; and Westerkamp, Douglas F., 4,114,684, Cl. 165-82.000.

Mazgaj, Robert M.: *See—*
Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., 4,115,215, Cl. 204-67.000.

Mazzamauro, Robert: *See—*
Hart, Robert D.; and Mazzamauro, Robert, 4,115,769, Cl. 340-373.000.

McAfee, John Gilmore: *See—*
Subramanian, Gopal; and McAfee, John Gilmore, 4,115,541, Cl. 424-1.500.

McAleer, William J.; and Hurni, William M., to Merck & Co., Inc. Automated plate reader. 4,115,010, Cl. 356-201.000.

McBane, Bruce N.: *See—*
Porter, Samuel, Jr.; and McBane, Bruce N., 4,115,472, Cl. 260-836.000.

McCabe, Francis J. Rotating blade fire damper. 4,114,646, Cl. 137-601.000.

McCain, Colin Christopher: *See—*
Crump, Ronald Alfred; and McCain, Colin Christopher, 4,115,130, Cl. 106-15.00R.

McCarthy, Cornelius J. D.: *See—*
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,115,804, Cl. 358-107.000.

McCarthy, William C.; and Dunn, Robert O., to Phillips Petroleum Company. Method of purifying polluted water. 4,115,264, Cl. 210-63.00R.

McClelland, Keener D. Method and apparatus for quieting a fowl eviscerating device. 4,114,239, Cl. 17-45.000.

McClenahan, Robert William: *See—*
Hoopes, Howard Sherman; McClenahan, Robert William; Walsh, Thomas Joseph; and Zecca, James William, 4,115,785, Cl. 346-34.000.

McDonald, William J., Jr.: *See—*
Maurer, William C.; McDonald, William J., Jr.; and Ward, Charles E., 4,114,702, Cl. 175-107.000.

McDonald, William Jesse, Jr.: *See—*
Maurer, William Casper; Sinclair, Albert Richard; and McDonald, William Jesse, Jr., 4,114,704, Cl. 175-107.000.

McDonnell Douglas Corporation: *See—*
Buonadonna, Victor R.; Richardson, Ralph J.; Rasmussen, Richard L.; and Jeffers, William Q., 4,115,168, Cl. 149-109.600.

McElroy, David J., to Texas Instruments Incorporated. Electronic calculator with push-button on-off system. 4,115,705, Cl. 307-140.000.

McGaha, George Vernon, to Pelton & Crane Company. Handpiece instrument console apparatus having improved mechanisms for extending and retracting operating flexible hose. 4,114,273, Cl. 32-22.000.

McGhee, Jerry R.; and Schaefer, Milton E., to University of Alabama in Birmingham. Intraoral cup for collecting saliva and method of using the same. 4,114,605, Cl. 128-2.00F.

McGilvery, James D., to Erco Industries Limited. Phosphate composition. 4,115,307, Cl. 252-135.000.

McGrath, Neal, to Illinois Nuclear Electronics, Inc. Signal processing system for a gamma camera. 4,115,693, Cl. 250-363.00S.

McGraw-Edison Company: *See—*
Berlik, Lee; and Hurley, James E., 4,114,589, Cl. 126-21.00R.

McIntyre, David G.: *See—*
Pavlecka, Vladimir H.; and McIntyre, David G., 4,114,837, Cl. 244-26.000.

McKellin, Wilbur H.; and Swarts, William A., to Pennwalt Corporation. Reduction of carbonyl-containing dialkyl peroxides to hydroxy-containing dialkyl peroxides. 4,115,455, Cl. 260-610.00R.

McKerrow, George C.; Pelletier, Albert; and Fowler, Peter L., to Noranda Mines Limited. Silencer for use on tuyere punchers. 4,114,865, Cl. 266-136.000.

McLean, F. Ronald. Liquid volumetric line leak testing apparatus. 4,114,426, Cl. 73-40.50R.

McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., to Ralph M. Parsons Company, The. Process for the production of fuel values from carbonaceous materials. 4,115,075, Cl. 48-197.00R.

McNeil Corporation: *See—*
Smith, Thomas W.; and Bibbee, Jeffrey N., 4,115,046, Cl. 425-29.000.
Wegmann, Jerome B., 4,114,560, Cl. 116-117.00R.

McPherson, Roger E.: *See—*
Jackson, Billy G.; and McPherson, Roger E., 4,115,645, Cl. 544-20.000.

Mead Johnson & Company: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 4,115,571, Cl. 424-248.560.

Means, David K.; and Boenke, Clyde A., to Reliance Electric Company. Transportation system with individual programmable vehicle processors. 4,114,730, Cl. 187-29.00R.

Mediax, Inc.: *See—*
Taub, Herman P., 4,114,291, Cl. 35-36.000.

Medvick, Richard J., to Swagelok Company. Quick connect coupling. 4,114,853, Cl. 251-149.600.

Meehan, James Bartley: *See—*
Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, 4,115,779, Cl. 343-715.000.

Meehl, David W.: *See—*
Clark, Leonard R.; and Meehl, David W., 4,114,249, Cl. 29-513.000.

Meinke, Hans Heinrich; Flachenecker, Gerhard; Fastenmeier, Karl; Landstorfer, Friedrich; and Lindenmeier, Heinz, to Karl Storz Endoscopy-America, Inc. Cutting and coagulation apparatus for surgery. 4,114,623, Cl. 128-303.140.

Meischen, Sandra Jan: *See—*
Gale, Glen Roy; and Meischen, Sandra Jan, 4,115,418, Cl. 260-429.00R.

Melchior, Jean; and Andre, Thierry, to Etat Francais. Power unit. 4,114,379, Cl. 60-606.000.

Memminger, Gustav: *See—*
Fecker, Josef; and Memminger, Gustav, 4,114,823, Cl. 242-47.010.

Menahem, Salomon, to Superfile, Ltd. Suspended files. 4,114,963, Cl. 312-184.000.

Menasha Corporation: *See—*
Oiler, Willard E., 4,114,879, Cl. 273-34.00R.

Menschik, Judith: *See—*
Paul, Rolf; and Menschik, Judith, 4,115,572, Cl. 424-249.000.

Mercaldi, Renaldo: *See—*
Bovio, Robert J.; and Mercaldi, Renaldo, 4,114,903, Cl. 277-81.00R.

Mercier, Bernard, to Le Joint Francais. Seal ring comprising a hollow deformable metal element. 4,114,905, Cl. 277-164.000.

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Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,115,402, Cl. 260-332.20A.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,115,573, Cl. 424-250.000.
McAleer, William J.; and Hurni, William M., 4,115,010, Cl. 356-201.000.
Veber, Daniel F., 4,115,554, Cl. 424-177.000.

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Engel, Gerhard; and Eckle, Manfred, 4,115,312, Cl. 252-301.500.
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,115,456, Cl. 260-613.00R.

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Anderson, Joseph A., 4,115,200, Cl. 195-127.000.

Mery, Pierre. Motorized three wheel vehicle. 4,114,713, Cl. 180-27.000.

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Jager, Albert; Lucht, Alfred; and Munch, Gerhard, 4,114,864, Cl. 266-51.000.

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Konig, Rudolf; and Brunsch, Klaus, 4,114,962, Cl. 308-238.000.
Schubert, Klaus-Peter; Keller, Hartmut; and Hildebrandt, Juergen J., 4,114,464, Cl. 74-89.140.

Mester, Zoltan Csaba: *See—*
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apparatus for the manufacture of thread engageable members. 4,115,505, Cl. 264-242.000.
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Pockrandt, Gunter; and Fellner, Helmut, 4,115,079, Cl. 55-43.0BN.
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Jager, Hans; and Seipp, Emil, 4,115,164, Cl. 148-175.000.
Metcalf, James E., to Del Norte Technology, Inc. Synchronized pulse amplitude control for pulse measuring circuits. 4,115,773, Cl. 343-7.0AG.
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Realini, Enrico; and Langenegger, Werner, 4,114,706, Cl. 177-70.000.
Metz, Paul; Schockmel, Robert; Nick, Desire; and Pfeiffer, Paul, to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed. Process and apparatus for making expanded slag. 4,115,089, Cl. 65-19.000.
Meucci, Amleto. Speed convertors for providing variable drive ratios. 4,114,466, Cl. 74-117.000.
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Meyer, Frank: *See—*
Kubens, Rolf; and Meyer, Frank, 4,114,382, Cl. 405-264.000.
Meyer, Warren A. Device for synchronously rotating solar collectors. 4,114,594, Cl. 126-270.000.
Michaut, Claude: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.
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Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.
Micro Tec Instrumentation, Inc.: *See—*
Abels, Michael Allen, 4,114,601, Cl. 128-1.00R.
Midana, Fiorenzo. Golf game apparatus. 4,114,889, Cl. 273-176.00F.
Midland-Ross Corporation: *See—*
Stanuszek, Dennis M., 4,114,378, Cl. 60-589.000.
Walker, Peter J., 4,114,528, Cl. 100-47.000.
Midori Anzen Company, Ltd.: *See—*
Martin, Frank Eugene; and Rich, Edward Larmour, III, 4,115,069, Cl. 422-112.000.
Mihailovski, Alexander, to Stauffer Chemical Company. Bis-stannane insecticides. 4,115,581, Cl. 424-288.000.
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Mikami, Takashi, 4,115,813, Cl. 358-229.000.
Mikami, Takashi, to Mikami & Co., Ltd. Television enlarging display apparatus for graphic material. 4,115,813, Cl. 358-229.000.
Miki, Masayoshi: *See—*
Okubo, Masao; Miki, Masayoshi; and Ueda, Takeshi, 4,115,148, Cl. 134-21.000.
Milan, Daniel, to Societe B.V.S. Rock drilling tool having pulsed jets. 4,114,705, Cl. 175-340.000.
Miles Laboratories, Inc.: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,453, Cl. 260-586.00G.
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Das, Subodh K.; Cochran, C. Norman; Milito, Richard A.; Mazgaj, Robert M.; and Hill, Walter W., 4,115,215, Cl. 204-67.000.
Miller, David E.: *See—*
Brisk, Richard A.; and Miller, David E., 4,115,859, Cl. 364-476.000.
Miller, Frank. Anchor having built-in trip device. 4,114,554, Cl. 114-298.000.
Miller, George A.; and Owen, Ronald P., to Rohm and Haas Company. 1-Substituted aralkyl imidazoles. 4,115,578, Cl. 424-273.00R.
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Miller, Ward B., to Owens-Corning Fiberglas Corporation. Apparatus for packaging compressible strips. 4,114,530, Cl. 100-87.000.
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Mims, Carl C., Jr. Combination incontinent garment and liner. 4,114,621, Cl. 128-288.000.
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Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetramethyl-4-piperidyl carbonic acid esters of dihydric alcohols and phenols as stabilizers for synthetic polymers. 4,115,476, Cl. 260-880.00R.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Velocity detecting apparatus insensitive to noise. 4,115,831, Cl. 361-236.000.
Mindell, Marvin I., to Singer Company, The. Method for regaining synchronization between a visual image projector and an associated audio playback machine. 4,115,824, Cl. 360-80.000.
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Shafiee, Ali; Lalezari, Iraj; and Yassa, Narges, 4,114,314, Cl. 47-85.000.
Minnesota Mining and Manufacturing Company: *See—*
Cowman, Charles D., Jr.; and Shepherd, John P. G., 4,115,486, Cl. 264-1.000.
Degen, Peter John; and Lucas, Anthony James, 4,115,547, Cl. 424-60.000.
Ithakissios, Dionyssis S., 4,115,534, Cl. 424-1.000.
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,114,983, Cl. 350-164.000.
Robins, Janis; Kropp, James E.; and Young, Chung I., 4,115,295, Cl. 528-90.000.
Vandervort, John D., 4,114,236, Cl. 16-142.000.
Voegeli, Douglas W., 4,115,500, Cl. 264-122.000.
Minolta Camera Kabushiki Kaisha: *See—*
Metabi, Tsuneyo, 4,115,505, Cl. 264-242.000.
Minoura, Toshimi: *See—*
Kogure, Yoichi; Minoura, Toshimi; and Fujiwara, Toshio, 4,115,848, Cl. 364-107.000.
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Fujikawa, Tetsuzo; and Misawa, Kichiji, 4,114,586, Cl. 123-195.00A.
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Misek, Victor A.: *See—*
Schwartz, Jacob; and Misek, Victor A., 4,114,685, Cl. 165-96.000.
Mr. Christmas Incorporated: *See—*
Hermanson, Terry, 4,114,634, Cl. 135-19.500.
Misumi, Akira: *See—*
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.
Mitarai, Akira; and Fujiwara, Sigekazu, to Sharp Kabushiki Kaisha. Digital frequency shift signal demodulator. 4,115,738, Cl. 329-105.000.
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Jordan, Bertram Lee; and Mitchell, John Davis, 4,114,770, Cl. 214-130.00R.
Mitchell, Roderick A. Seed planting device with automatic seed covering. 4,114,543, Cl. 111-96.000.
Mitchener, Russel L.: *See—*
Sink, William H.; and Mitchener, Russel L., 4,114,743, Cl. 192-91.00R.
Mitsubishi Chemical Industries, Ltd.: *See—*
Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, 4,115,516, Cl. 423-239.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, 4,115,532, Cl. 423-492.000.
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Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, 4,115,369, Cl. 526-65.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kanki, Hiroshi; Yasuda, Kazuyoshi; and Tatsuke, Hisashi, 4,114,819, Cl. 242-18.00R.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Morimoto, Toshiki; and Hori, Sumisaburo, 4,114,351, Cl. 53-157.000.
Mitsui Sugar Co., Ltd.: *See—*
Shimizu, Junichi; and Hashizume, Kyosuke, 4,115,147, Cl. 127-54.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.
Mitsui Toatsu Kagaku Kabushiki Kaisha (Mitsui Toatsu Chem., Inc.): *See—*
Kobayashi, Sadao; and Okita, Yasuo, 4,115,338, Cl. 260-29.4UA.
Mitsuishi, Yukio; Shiozaki, Shigeru; and Hasegawa, Kinji, to Teijin Limited. Weather-resistant adhesive film. 4,115,617, Cl. 428-336.000.
Miura, Nobuhiro: *See—*
Yamakawa, Yoshio; Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,114,569, Cl. 123-30.00D.
Miura, Yoshio; Kobayashi, Kazuhiro; and Yusa, Koue, to Hitachi, Ltd. Coil winding apparatus. 4,114,432, Cl. 72-135.000.
Miyachi, Nobuji; Ogawa, Akira; Miyake, Keniti; and Onishi, Isao, to Miyachi Sewing Machine Co., Ltd. Apparatus for forming loops on a garment. 4,114,544, Cl. 112-104.000.
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Miyachi, Nobuji; Ogawa, Akira; Miyake, Keniti; and Onishi, Isao, 4,114,544, Cl. 112-104.000.
Miyake, Keniti: *See—*
Miyachi, Nobuji; Ogawa, Akira; Miyake, Keniti; and Onishi, Isao, 4,114,544, Cl. 112-104.000.
Miyake, Toshinobu: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.
Miyamoto, Akihiko: *See—*
Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, 4,115,117, Cl. 96-29.00D.
Miyamoto, Norioki: *See—*
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with auto-focussing of a light beam at a record carrier surface. 4,115,808, Cl. 358-127.000.
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Ohno, Masayoshi; Kakuta, Akio; Miyauchi, Terukatsu; and Kikuchi, Tatsuji, 4,115,081, Cl. 55-64.000.
Mizobuchi, Yuzo: *See—*
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.
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Mobay Chemical Corporation: *See—*
Chadwick, David H., 4,115,304, Cl. 521-167.000.
Reiff, Helmut F.; and Pantone, Richard S., 4,115,429, Cl. 260-453.0SP.
Mobil Oil Corporation: *See—*
Downs, John D., 4,115,473, Cl. 260-850.000.
Foster, William R.; and Snavely, Earl S., Jr., 4,114,693, Cl. 166-305.00R.
Glenn, Edwin E., Jr., 4,114,721, Cl. 181-105.000.
Kesler, Michael G., 4,115,471, Cl. 260-683.430.
Patton, Bobbie J.; Sexton, James H.; Gravley, Wilton; and Foster, C. Mackay, Jr., 4,114,435, Cl. 73-151.500.
Schmitt, Kirk D., 4,115,288, Cl. 252-50.000.
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, to Printing Developments, Inc. Electronic screening. 4,115,816, Cl. 358-283.000.
Moeller & Neumann GmbH: *See—*
Bier, Albert; and Vogelgesang, Herbert, 4,114,416, Cl. 72-238.000.
Mogi, Keitaro: *See—*
Noda, Fumio; Mogi, Keitaro; and Sakasai, Toshio, 4,115,591, Cl. 426-7.000.
Molenaar, Lester V. Spring toy. 4,114,306, Cl. 46-1.00R.
Molins Limited: *See—*
Davies, Robert William; and Applegate, Barry George, 4,114,355, Cl. 53-389.000.
Davies, Robert William; and Willett, Peter Ernest, 4,114,872, Cl. 271-91.000.
Labbe, Francis Auguste Maurice; and Hirsh, Ivan Yehudi, 4,114,631, Cl. 131-84.00C.
Monarch Marking Systems, Inc.: *See—*
Dobras, Bruce W., 4,115,703, Cl. 250-568.000.
Monastyrskaya, Natalya Borisovna: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Monkelbaan, Edwin R., to Xerox Corporation. Method of forming tubular metal products. 4,114,431, Cl. 72-122.000.
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Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,115,065, Cl. 23-230.600.
Monsanto Company: *See—*
Bach, Hartwig C., 4,115,503, Cl. 264-184.000.
Cartier, George E., 4,115,622, Cl. 428-409.000.
Deets, Gary L., 4,115,353, Cl. 260-45.75C.
Deex, Oliver D.; and Weiss, Virgil W., 4,115,357, Cl. 528-294.000.
Fields, Joseph E.; and Johnson, John H., 4,115,550, Cl. 424-78.000.
Franz, John E.; and Howe, Robert K., 4,115,095, Cl. 71-90.000.
Franz, John E., 4,115,104, Cl. 71-105.000.
Griffith, Edward J., 4,115,233, Cl. 204-180.00R.
Morris, Alonzo E., 4,115,477, Cl. 260-880.00R.
Unland, Mark L.; and Barker, George E., 4,115,424, Cl. 252-432.000.
Monsanto Research Corporation: *See—*
Salyer, Ival O.; and North, Charles J., 4,115,499, Cl. 264-122.000.
Montedison S.p.A.: *See—*
DeFeo, Francesco; Gemini, Vincenzo; and Floridia, Luigi, 4,115,057, Cl. 8-54.000.
Gritti, Sergio, 4,115,291, Cl. 252-73.000.
Scata, Umberto; Luciani, Luciano; and Barbe, Pier Camillo, 4,115,319, Cl. 252-429.00B.
Monville, Jean-Michel: *See—*
Colonna, Jerome; Monville, Jean-Michel; and Munoz, Francois, 4,114,739, Cl. 192-41.00A.
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Moore, Donald G., to Chemetron Corporation. Method for automatically heating variable numbers and sizes of food items or the like, in an electromagnetic oven. 4,115,679, Cl. 219-10.55M.
Moore, Donald G., to Chemetron Corporation. Apparatus for providing temperature equalization cycles for a microwave oven. 4,115,680, Cl. 219-10.55B.
Moore, Francis Claudell; and Perkinson, Leon Raymond, to Moore-Perk Corporation. Patient treatment pad for hot or cold use. 4,114,620, Cl. 128-254.000.
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Moore, Francis Claudell; and Perkinson, Leon Raymond, 4,114,620, Cl. 128-254.000.
Moran, David Patrick Joseph, to Lever Brothers Company. Phase inverting low fat spreads. 4,115,598, Cl. 426-604.000.
Morcos, Ikram, to Hydro-Quebec. Method for obtaining high activity electrocatalysts on pyrolytic graphite. 4,115,322, Cl. 252-447.000.
Morejon, Clara B.: *See—*
Driscoll, Richard C.; and Morejon, Clara B., 4,115,537, Cl. 424-1.000.
Morgan, Barrie O., to Datotek, Inc. Random digital code generator. 4,115,657, Cl. 178-22.000.
Morgan, William L.: *See—*
Salsbury, Phillip J.; Perlegos, George; and Morgan, William L., 4,114,255, Cl. 29-571.000.
Morganroth, Shila. Method of selectively altering hair color. 4,114,632, Cl. 132-7.000.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Indexing device. 4,114,301, Cl. 40-389.000.
Mori, Yasunori, to Hitachi, Ltd. Electronic ignition timing control device for internal combustion engines. 4,114,573, Cl. 123-117.00D.
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Nagamine, Kazuaki, 4,114,522, Cl. 99-348.000.
Morio, Minoru; and Kambara, Masahiro, to Sony Corporation. System for reproducing a video signal. 4,115,820, Cl. 360-33.000.
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Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, 4,114,358, Cl. 57-51.000.
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Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,115,868, Cl. 364-900.000.
Morre, D. James; Kloppel, Thomas M.; and Keenan, Thomas W., to Purdue Research Foundation. Cancer detection by serum analysis of glycolipids. 4,115,062, Cl. 23-230.00B.
Morris, Alonzo E., to Monsanto Company. Process for recovering graft copolymers latex solids wherein a fines fraction is recycled and incorporated in said solids. 4,115,477, Cl. 260-880.00R.
Morris, David Lindsey: *See—*
Hornby, William Edward; and Morris, David Lindsey, 4,115,305, Cl. 260-6.000.
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Morris, Richard L., to Outboard Marine Corporation. Lawn mower blade mounting. 4,114,354, Cl. 56-295.000.
Morris, William E. Sludge dewatering apparatus. 4,115,275, Cl. 210-386.000.
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Wise, Lawrence D.; and Morrison, Glenn C., 4,115,565, Cl. 424-246.000.
Morrison, Leonard A.: *See—*
Spainhour, Phillip A.; Hampton, Robert S., Jr.; and Morrison, Leonard A., 4,114,283, Cl. 33-337.000.
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Morrow, Larry N. Throwing disc. 4,114,885, Cl. 273-106.00B.
Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J., 4,115,387, Cl. 260-286.00R.
Wright, George C.; and Goldenberg, Marvin M., 4,115,405, Cl. 260-345.200.
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Pasieka, Arnold Roy; Wilson, John Corner; and Moruzi, George Alexander, 4,114,954, Cl. 302-14.000.
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Mossman, David C.: *See—*
Osder, Stephen S.; and Mossman, David C., 4,115,847, Cl. 364-101.000.
Mosteller, Marston D.: *See—*
Zepp, Lawrence C.; and Mosteller, Marston D., 4,115,009, Cl. 356-201.000.
Motoren-und Turbinen-Union Munchen GmbH: *See—*
Bauer, Heinrich Franz; Eichinger, Anton; and Feitzelmayer, Ernst, 4,115,174, Cl. 156-155.000.
Motorola, Inc.: *See—*
daCosta, Harry H.; Foster, Victor W.; and Thornton, Charles G., deceased, 4,115,713, Cl. 310-49.00R.
Skutta, Frank Robert, 4,115,741, Cl. 330-284.000.

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Muhle, Dietrich, to Upjohn Company, The. Frothing method and an apparatus for carrying out the method. 4,115,299, Cl. 521-170.000.

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Mukhamedyarov, Rashid Mustafievich; Smirnov, Boris Andreevich; Sery, Stanislav Vasilievich; Titkova, Tatyana Dmitrievna; and Lokalov, Anatoly Ivanovich. Apparatus for separation of chemical compounds and production of sterile solutions. 4,115,272, Cl. 210-266.000.

Mulaskey, Bernard F., to Chevron Research Company. Hydrocarbon hydroconversion with a catalyst having interconnected macropores. 4,115,248, Cl. 208-112.000.

Mulcahy, Harry William: *See—*
Strugielski, Ronald T.; and Mulcahy, Harry William, 4,114,540, Cl. 105-226.000.

Muller, Ekkehard Walter: *See—*
Kirner, Hans Dieter; Bitterlin, Albert; and Muller, Ekkehard Walter, 4,115,055, Cl. 8-26.000.

Muller, Gunter. Sauna. 4,114,205, Cl. 4-160.000.

Muller, Hans: *See—*
Thoma, Georg; and Muller, Hans, 4,114,821, Cl. 242-43.00R.

Muller, Hans Jurgen: *See—*
Henes, Gerhard; Muller, Hans Jurgen; Gupta, Pramod; and Zirner, Joachim, 4,115,373, Cl. 528-48.000.

Muller, Rolf, to Papst-Motoren KG. Brushless d. c. motor. 4,115,715, Cl. 310-68.00B.

Muller, Wolfgang, to Chemische Werke Huls AG. Method for producing hexachlorocyclobutene. 4,115,460, Cl. 260-648.00R.

Mulroy, Terence J., to Champion International Corporation. Corner lock bulk bin. 4,114,795, Cl. 229-23.00R.

Multech Corp.: *See—*
Joynt, Gerald E.; and Mayhew, Michael R., 4,114,944, Cl. 296-50.000.

Multinorm, B.V.: *See—*
Oosterling, Pieter Adriaan; and Baecke, Antoine Marinus Rene, 4,114,814, Cl. 239-689.000.

Munch, Gerhard: *See—*
Jager, Albert; Lucht, Alfred; and Munch, Gerhard, 4,114,864, Cl. 266-51.000.

Mundus, Friedhelm: *See—*
Achelpohl, Fritz; and Mundus, Friedhelm, 4,115,183, Cl. 156-515.000.

Munk, Edmund, to Furnier- und Sperrholzwerk J. F. Werz Jr. KG Werzalit-Pressholzwerk Oberstenfeld. Molding method. 4,115,490, Cl. 264-26.000.

Munoz, Francois: *See—*
Colonna, Jerome; Monville, Jean-Michel; and Munoz, Francois, 4,114,739, Cl. 192-41.00A.

Murata, Katsuhiro: *See—*
Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, 4,114,282, Cl. 33-180.00R.

Murata Kikai Kabushiki Kaisha: *See—*
Deno, Kohji, 4,114,539, Cl. 104-165.000.

Murata Manufacturing Co., Ltd.: *See—*
Sakabe, Yukio; and Seno, Hiroshi, 4,115,493, Cl. 264-61.000.

Murata, Ryoji, to Agency of Industrial Science & Technology. Method for optically measuring a roughness profile of surface. 4,115,005, Cl. 356-120.000.

Muraz, Jean-Max; Payre, Michel; and Rampin, Pierre, to Crouzet. Devices for measuring the flow speed of a fluid. 4,114,438, Cl. 73-194.00A.

Murray Corporation: *See—*
Kish, Arthur S., 4,114,656, Cl. 138-109.000.

Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Separation of phenol-, cyclohexanone-, and cyclohexylbenzene-containing mixtures employing an N,N-disubstituted amide. 4,115,204, Cl. 203-60.000.

Murtha, Timothy P., to Phillips Petroleum Company. Separation of phenol-, cyclohexanone-, and cyclohexylbenzene-containing mixtures employing an N-substituted lactam. 4,115,205, Cl. 203-60.000.

Murtha, Timothy P., to Phillips Petroleum Company. Separation of phenol-, cyclohexanone-, and cyclohexylbenzene-containing mixtures employing an organic carbonate. 4,115,206, Cl. 203-60.000.

Murtha, Timothy P., to Phillips Petroleum Company. Separation of phenol-, cyclohexanone-, and cyclohexylbenzene-containing mixtures employing a trisubstituted phosphate. 4,115,207, Cl. 203-60.000.

Murtha, Timothy P., to Phillips Petroleum Company. Production of cycloalkylaromatics. 4,115,463, Cl. 260-668.00B.

Murvall, Ake Eugen, to ABU Aktiebolag. Fishing reel with a line spreading device. 4,114,825, Cl. 242-84.21R.

Muryoi, Takeshi, to Nippon Kogaku K.K. Zoom lens barrel capable of macro-photography. 4,114,984, Cl. 350-187.000.

Musoh, Masanori: *See—*
Takahashi, Reijiro; Musoh, Masanori; and Ito, Tosikazu, 4,114,397, Cl. 62-516.000.

Muto, Osamu: *See—*
Usui, Kazuhisa; and Muto, Osamu, 4,114,746, Cl. 192-104.00R.

N L Industries, Inc.: *See—*
Libsch, Karl David; and Rao, Mannige Vikram, 4,115,109, Cl. 75-77.000.

Nachtigal, Julius Harvey: *See—*
Vidra, James David; and Nachtigal, Julius Harvey, 4,115,546, Cl. 424-50.000.

Nachtrieb, Robert W., to Fotel Inc. Graphic aid and method and system of making reproductions therefrom. 4,115,003, Cl. 355-133.000.

Nackenson, Joel J., to J.J. Lester & Co., Inc. Round back spring binder. 4,114,240, Cl. 24-67.110.

Naevestad, Roy, to Wilputte Corporation. Seal for coke oven doors. 4,115,203, Cl. 202-248.000.

Nagahara, Shigehiro: *See—*
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.

Nagai, Nobuyuki: *See—*
Yamamura, Hideo; Matsuo, Katsuharu; and Nagai, Nobuyuki, 4,115,677, Cl. 219-10.49R.

Nagamine, Kazuaki, to Morinaga & Co., Ltd. Method and apparatus for automatically detecting and controlling the degree of caramelization of candies. 4,114,522, Cl. 99-348.000.

Nagano, Genzo; Nakamura, Hiroshi; and Sohma, Yukio, to Fujitsu Limited. Memory access control system. 4,115,851, Cl. 364-200.000.

Nagel, Robert I., to Dominion Auto Accessories Limited. Warning lamp. 4,115,843, Cl. 362-291.000.

Nagle, Dennis C.: *See—*
Christner, Larry G.; Nagle, Dennis C.; and Watson, Paul R., 4,115,528, Cl. 423-449.000.
Christner, Larry G.; and Nagle, Dennis C., 4,115,627, Cl. 429-44.000.

Naglieri, Anthony N.; and Rizkalla, Nabil, to Halcon International, Inc. Process for converting thallium (I) to thallium (III). 4,115,419, Cl. 260-429.00R.

Nahara, Akira: *See—*
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.

Nakada, Akira: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,114,497, Cl. 84-1.170.

Nakagawa, Hiroshi. Exothermic metallic composition. 4,114,591, Cl. 126-263.000.

Nakagawa, Yasuhiko: *See—*
Sakai, Yasuo; Nakagawa, Yasuhiko; and Nakajima, Yasuo, 4,114,373, Cl. 60-282.000.

Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. Facsimile signal coding method. 4,115,815, Cl. 358-260.000.

Nakajima, Hiroyuki; and Hosokawa, Takashi, to Konan Electric Co., Ltd. Double acting electromagnetic valve. 4,114,648, Cl. 137-625.500.

Nakajima, Yasuo: *See—*
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,114,643, Cl. 137-495.000.
Sakai, Yasuo; Nakagawa, Yasuhiko; and Nakajima, Yasuo, 4,114,373, Cl. 60-282.000.

Nakamura, Hiroshi: *See—*
Nagano, Genzo; Nakamura, Hiroshi; and Sohma, Yukio, 4,115,851, Cl. 364-200.000.

Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, to Kowa Company Ltd. Isoindoline derivatives and the acid addition salts thereof and process for the preparation of same. 4,115,398, Cl. 260-326.100.

Nakamura, Tutomu; Shigemasa, Junichiro; and Tani, Zenpei, to Sharp Kabushiki Kaisha. Igniter utilizing a negative resistance light emitting diode. 4,115,832, Cl. 361-256.000.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Nakase, Takamichi; and Kohama, Tokio, 4,114,578, Cl. 123-124.00R.

Nakasugi, Hajime: *See—*
Narihara, Katsuhiko; Nakasugi, Hajime; and Yamaguchi, Masanobu, 4,115,675, Cl. 219-10.410.

Nametkin, Nikolai Sergeevich: *See—*
Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,468, Cl. 260-683.15D.

Nanthavong, Souli; Pigerol, Charles; Eymard, Pierre; and Simiand, Jacques, to Labaz. Prostaglandin derivatives and process for preparing the same. 4,115,401, Cl. 260-326.430.

Napp Systems (USA), Inc.: *See—*
Okai, Sakuo; and Tsuchida, Shozo, 4,115,119, Cl. 96-35.100.
Okai, Sakuo; and Tsuchida, Shozo, 4,115,123, Cl. 96-79.000.

Nardi, John C.; Hussey, Charles L.; King, Lowell A.; and Carpio, Ronald A. Method for the preparation of 1-alkyl pyridinium chlorides. 4,115,390, Cl. 260-290.0HL.

Narihara, Katsuhiko; Nakasugi, Hajime; and Yamaguchi, Masanobu, to Nippon Steel Corporation. Induction heating method of steel pipe. 4,115,675, Cl. 219-10.410.

Narita, Toshiro: *See—*
Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, 4,115,439, Cl. 562-402.000.

Nartron Corporation: *See—*
Bull, Dale L.; and Rautiola, Norman A., 4,115,844, Cl. 362-382.000.

Naseck, Melvin L.; and Hickman, Mark R., to Conservation Controls Corp. Control system. 4,114,807, Cl. 236-1.00E.

Nash, Claude H., III: *See—*
Queener, Stephen W.; and Nash, Claude H., III, 4,115,197, Cl. 195-36.00R.

National Distillers and Chemical Corporation: *See—*
Qualey, Christian H., 4,115,173, Cl. 156-120.000.

National Petro Chemicals Corporation: *See—*
Speca, Anthony N., 4,115,318, Cl. 252-428.000.

National Research Development Corporation: *See—*
Hornby, William Edward; and Morris, David Lindsey, 4,115,305, Cl. 260-6.000.
Lewis, Meirion Francis, 4,115,744, Cl. 331-16.000.
Mansfield, Peter, 4,115,730, Cl. 324-0.50A.

National Research Institute For Metals: *See—*
Kametani, Hiroshi; and Aoki, Aiko, 4,115,222, Cl. 204-117.000.

National Semiconductor Corporation: *See—*
Varadi, Andrew G., 4,115,871, Cl. 365-149.000.

National Standard Company: *See—*
Snavely, Cloyd A.; and Smith, John A., 4,115,106, Cl. 75-0.5AA.

National Supply Company (U.K.) Limited: *See—*
Goodacre, John Purefoy; Potter, Colin; and Ball, Peter, 4,114,662, Cl. 141-387.000.

Nauta, Jelle G. Motor ventilation system for wet/dry vacuum cleaner. 4,114,231, Cl. 15-413.000.

NCR Corporation: *See—*
Marinelli, Nicola, 4,115,315, Cl. 252-316.000.

Needham, Donald G., to Phillips Petroleum Company. Antifriction composition. 4,115,283, Cl. 252-12.400.

Neely, James Edwin, Jr., to PPG Industries, Inc. Method and apparatus for preventing bubble nucleation and growth in a molten glass delivery facility. 4,115,092, Cl. 65-99.00A.

Nelson, David H., to Van Dyke, Homer; Van Dyke, Dave; Dorian, Mark; and Lerg, George, part interest to each. Manufacture of solar reflectors. 4,115,177, Cl. 156-245.000.

Nelson, Eldrid W., to Chas. Olson & Sons; and Wheel Service Co., Inc. Detachable seat mounting for buses. 4,114,947, Cl. 297-344.000.

Nelson, Marvin D., to Honeywell Inc. Electrical thermostat control apparatus. 4,114,445, Cl. 73-360.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-ω-phenyl-pgd$_1$ compounds. 4,115,454, Cl. 260-590.00C.

Nelson, Robert C.: *See—*
Bozzi, Edward G.; and Nelson, Robert C., 4,115,328, Cl. 260-24.000.

Nelson, Roy G.: *See—*
Smith, William E.; and Nelson, Roy G., 4,114,248, Cl. 29-460.000.

Netz, Otto: *See—*
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, 4,115,261, Cl. 210-40.000.

Neudorfer, Ernst: *See—*
Boese, Gunter; Neudorfer, Ernst; and Schollmeier, Gero, 4,115,687, Cl. 235-92.0DM.

Neuhardt, Walther C. Wasted spacer member for wall elements, especially for glass bricks. 4,114,337, Cl. 52-442.000.

New Zealand Inventions Development Authority: *See—*
Garden, Graham Miller; and Harwood, Richard James, 4,114,463, Cl. 74-61.000.

Newell, John Henry, to Newtron Co. (Ancaster) Ltd. Air cleaner assembly. 4,115,082, Cl. 55-103.000.

Newell, William K.; and Tomson, Elizabeth C. Skate board. 4,114,913, Cl. 280-12.00H.

Newton, Alwin B., to Solation Products, Inc. Thermal storage and heat transfer system and method. 4,114,600, Cl. 126-271.000.

Newton, David Francis: *See—*
Greenhalgh, Colin William; Carey, John Laurence; and Newton, David Francis, 4,115,404, Cl. 260-343.30R.

Newtron Co. (Ancaster) Ltd.: *See—*
Newell, John Henry, 4,115,082, Cl. 55-103.000.

Nichols Engineering & Research Corporation: *See—*
Spater, Stuart S., 4,115,317, Cl. 252-418.000.

Nicholson, Terence Peter. Metal seals or gaskets. 4,114,908, Cl. 277-211.000.

Nick, Desire: *See—*
Metz, Paul; Schockmel, Robert; Nick, Desire; and Pfeiffer, Paul, 4,115,089, Cl. 65-19.000.

Nicoa Corporation: *See—*
Rogen, Neil E., 4,114,559, Cl. 116-114.500.

Nicodemus, Robert N., Jr.; Bosler, James W.; and Kershner, Marvin R., to American Chain & Cable Company, Inc. Hanging goods sorter. 4,114,538, Cl. 104-88.000.

Nieber, Allen J., to Efficiency Production, Inc. Portal frame for trench box stack. 4,114,383, Cl. 405-282.000.

Nied, Gerhard: *See—*
Link, Otmar; and Nied, Gerhard, 4,114,324, Cl. 52-2.000.

Nielsen, William C., to Chevron Research Company. Retractable fluids spraying assembly. 4,115,072, Cl. 422-207.000.

Nihon Kagaku Sangyo Co., Ltd.: *See—*
Tsukamoto, Takeo; Okamura, Miyoshi; and Kutami, Toshio, 4,115,211, Cl. 204-37.00R.

Niimura, Tsutomu: *See—*
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,115,737, Cl. 325-459.000.

Nikawa, Akio: *See—*
Akashi, Tetsuya; and Nikawa, Akio, 4,114,670, Cl. 151-41.720.

Nikiforov, Mikhail Borisovich: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Nilsen, Walter, to Den Norske Gipsplatefabrikk A/S. Method for the production of houses. 4,114,345, Cl. 52-745.000.

Nippon Columbia Kabushikikaisha: *See—*
Ogura, Keiichiro, 4,115,666, Cl. 179-100.4ST.

Nippon Electric Co., Ltd.: *See—*
Inoue, Yasukazu; and Kikuchi, Masanori, 4,115,709, Cl. 307-304.000.
Suzuki, Etsuo; and Sakurai, Hidekazu, 4,115,817, Cl. 358-288.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,114,498, Cl. 84-1.190.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,114,497, Cl. 84-1.170.
Hoshi, Juro; and Watanabe, Makoto, 4,114,830, Cl. 242-191.000.
Tomisawa, Norio, 4,114,495, Cl. 84-1.010.
Yokoyama, Kenji, 4,115,742, Cl. 330-297.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, 4,115,439, Cl. 562-402.000.

Nippon Kogaku K.K.: *See—*
Ishibashi, Kazufumi; and Ichimura, Takeo, 4,115,131, Cl. 106-47.00Q.
Muryoi, Takeshi, 4,114,984, Cl. 350-187.000.
Yamamoto, Hiroshi; and Fukuoka, Shigetada, 4,114,890, Cl. 273-237.000.

Nippon Kynol Incorporated: *See—*
Kimura, Isao; and Yata, Sizukuni, 4,115,364, Cl. 260-841.000.

Nippon Mining Co., Ltd: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.

Nippon Oil Co., Ltd.: *See—*
Kinoshita, Hirotugu; Sekiya, Makoto; and Makino, Nobuo, 4,115,284, Cl. 252-29.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Nakase, Takamichi; and Kohama, Tokio, 4,114,578, Cl. 123-124.00R.
Inagaki, Mitsuo; Sasaya, Hideaki; and Kurahashi, Takashi, 4,115,030, Cl. 416-93.00R.
Kasagi, Takao; Kuwakado, Satoshi; and Takei, Toshihiro, 4,114,924, Cl. 280-740.000.
Yamaguchi, Hiroaki; and Fujinami, Hiroshi, 4,115,764, Cl. 340-530.000.

Nippon Steel Corporation: *See—*
Narihara, Katsuhiko; Nakasugi, Hajime; and Yamaguchi, Masanobu, 4,115,675, Cl. 219-10.410.

Nippon Telegraph and Telephone Public Corporation: *See—*
Fujimoto, Isao; Aiba, Masahiko; Yamamoto, Yoichi; and Makita, Tomoo, 4,115,787, Cl. 346-75.000.
Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, 4,114,981, Cl. 350-96.330.
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.

Nippon Television Industry Corporation: *See—*
Mikado, Tsuneo, 4,115,810, Cl. 358-139.000.

Nippon Zeon Co. Ltd.: *See—*
Goto, Kuniaki; and Kodama, Kazumi, 4,115,355, Cl. 260-45.95H.

Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Field effect transistor with reduced series resistance. 4,115,793, Cl. 357-22.000.

Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,114,577, Cl. 123-119.00A.
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,114,643, Cl. 137-495.000.
Iijima, Tetsuya, 4,115,671, Cl. 200-61.910.
Ikeura, Kenji, 4,114,372, Cl. 60-276.000.
Masuda, Tetsuzo; Tagawa, Tomiyasu; Yoshioka, Hachiro; and Akahoshi, Takashi, 4,115,071, Cl. 422-179.000.
Sakai, Yasuo; Nakagawa, Yasuhiko; and Nakajima, Yasuo, 4,114,373, Cl. 60-282.000.

Nissei Plastics Industrial Co., Ltd.: *See—*
Shima, Yoshiharu, 4,115,506, Cl. 264-250.000.

Nisso Petrochemical Industries Co., Ltd.: *See—*
Yoshihara, Hiroshi; Tobita, Takashi; Tomizawa, Ryoichi; and Ishikawa, Kunio, 4,115,415, Cl. 260-410.000.

Nixon, Jeddy Darr, Jr.: *See—*
Matson, Lawrence Wayne, Jr.; Nixon, Jeddy Darr, Jr.; and Remont, Larry Joseph, 4,114,703, Cl. 175-107.000.

Noda, Fumio; Mogi, Keitaro; and Sakasai, Toshio, to Kikkoman Shoyu Co. Ltd. Process for producing koji and utilization of the koji. 4,115,591, Cl. 426-7.000.

Noggle, Ralph Carl: *See*—
Krider, Edmund Philip; Noggle, Ralph Carl; and Uman, Martin Allan, 4,115,732, Cl. 324-72.000.
Nohira, Hidetaka; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust pressure regulating system. 4,114,575, Cl. 123-119.00A.
Noirel, Yves Maurice: *See*—
Guinet, Yves Maurice; and Noirel, Yves Maurice, 4,115,662, Cl. 179-15.0BV.
Nonn, Konrad: *See*—
Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, 4,115,379, Cl. 260-163.000.
Nopper, Peter, to Zumback Electronic AG. Device for measuring at least one dimension of an object and a method of operating said device. 4,115,702, Cl. 250-560.000.
Noranda Mines Limited: *See*—
Kerfoot, Derek G. E., 4,115,512, Cl. 423-24.000.
McKerrow, George C.; Pelletier, Albert; and Fowler, Peter L., 4,114,865, Cl. 266-136.000.
Norbeck, Edwin, to University of Iowa Research Foundation, The. Pad for woodwind musical instrument. 4,114,500, Cl. 84-385.00P.
Nordin, Robert W., to Teletype Corporation. Printing machine with automatic off-center crown roller ribbon-wear compensation. 4,114,751, Cl. 400-248.000.
Nordisk Insulinlaboratorium: *See*—
Pedersen, Erik, 4,115,375, Cl. 260-112.00R.
Norell, Maria: *See*—
Larsson, Karl-Georg; and Norell, Maria, 4,115,217, Cl. 204-95.000.
Norlin, Stig Ivar, to Saab-Scania Aktiebolag. Bumper attachment. 4,114,937, Cl. 293-85.000.
Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,114,549, Cl. 112-410.000.
Norsk Cerealinstitutt ved Statens Teknologiske Institutt: *See*—
Knutrud, Leif Brudal, 4,115,596, Cl. 426-497.000.
North, Charles J.: *See*—
Salyer, Ival O.; and North, Charles J., 4,115,499, Cl. 264-122.000.
Northern Telecom Limited: *See*—
Dyment, John Cameron, 4,115,150, Cl. 148-1.500.
Poulsen, Robert Gordon, 4,115,184, Cl. 156-626.000.
Northwestern University: *See*—
Burton, Ralph Ashby, 4,114,567, Cl. 123-30.00A.
Norton, David A. Ball retriever. 4,114,881, Cl. 273-73.00R.
Nose, Taiji: *See*—
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,115,613, Cl. 428-207.000.
Noshiro, Atsumi; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co., Ltd., part interest to each. Printing ink compositions. 4,115,329, Cl. 260-25.000.
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich. Method of producing cement clinker from chlorine-containing raw mixture. 4,115,137, Cl. 106-100.000.
Nudelman, Boris Izrailovich; Sventsitsky, Alexandr Sergeevich; Bikbau, Marsel Yanovich; Bun, Isaak Mozesovich; and Kevvai, Arnold Arnoldovich. Raw mixture for the production of cement. 4,115,138, Cl. 106-100.000.
N.V. Industrieele Handelscombinatie Holland: *See*—
Pot, Hendrik, 4,114,901, Cl. 277-34.300.
Nyi, Kayson; and Graham, Sandra I., to Rohm and Haas Company. Curing photopolymerizable compositions containing n-substituted acryloyloxyethyl amines. 4,115,232, Cl. 204-159.230.
Oakes, John J.: *See*—
Jones, Terry H.; and Oakes, John J., 4,114,229, Cl. 15-320.000.
Oberle, Arthur, to BBC Brown Boveri & Company Limited. Combined stop and control valve. 4,114,651, Cl. 137-630.140.
Oberle, Arthur, to BBC Brown Boveri & Company Limited. Combined stop and control valve. 4,114,652, Cl. 137-630.140.
O'Brien, Elva R., executrix: *See*—
O'Brien, Richard C., deceased; and O'Brien, Elva R., executrix, 4,115,188, Cl. 162-190.000.
O'Brien, Harry W., Jr. Apparatus for and method of interconnecting and controlling units of a power train for maximum flexibility and economy in operating auxilliary marine vessels. 4,114,555, Cl. 115-76.000.
O'Brien, John T.; and White, Woodrow W., to Uniroyal, Inc. Bisulfite terminated oligomers as dispersing agents. 4,115,435, Cl. 260-465.400.
O'Brien, Richard C., deceased; and by O'Brien, Elva R., executrix. Method for recycling paper mill waste water. 4,115,188, Cl. 162-190.000.
O'Connell, John J.: *See*—
Rockett, Thomas J.; and O'Connell, John J., 4,115,487, Cl. 264-16.000.
Oda, Hatsuo: *See*—
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, 4,114,999, Cl. 355-10.000.
Odazima, Mituo: *See*—
Ogasawala, Nobuhiko; Odazima, Mituo; and Watanabe, Yasuaki, 4,115,716, Cl. 310-153.000.
Ogasawala, Nobuhiko; Odazima, Mituo; and Watanabe, Yasuaki, to Hitachi, Ltd. Rotor of magneto generator. 4,115,716, Cl. 310-153.000.
Ogawa, Akira: *See*—
Miyachi, Nobuji; Ogawa, Akira; Miyake, Keniti; and Onishi, Isao, 4,114,544, Cl. 112-104.000.
Ogawa, Shin-ichi: *See*—
Fujimoto, Takeo; Torimaru, Yasuo; Ogawa, Shin-ichi; and Yasue, Shinya, 4,115,796, Cl. 357-42.000.
Ogden, Barry: *See*—
Oye, Lloyd J.; and Ogden, Barry, 4,114,965, Cl. 312-209.000.
Ogisu, Kenji; and Enomoto, Masahisa, to Sony Corporation. Electrodeposition process & apparatus. 4,115,213, Cl. 204-39.000.
Ogura, Keiichiro, to Nippon Columbia Kabushikikaisha. Discrete 4-channel stereo recording and/or reproducing system compatible with matrix systems. 4,115,666, Cl. 179-100.4ST.
Ohkawa, Kozo, to Toyo Seikan Kaisha, Ltd. Apparatus for use in an automatic and continuous manufacture line for manufacturing the outer cylindrical cases of dry cells. 4,114,550, Cl. 113-7.00R.
Ohloff, Gunther: *See*—
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,114,630, Cl. 131-17.00R.
Ohno, Masayoshi; Kakuta, Akio; Miyauchi, Terukatsu; and Kikuchi, Tatsuji, to Tokyo Shibaura Electric Co., Ltd.; and Miyauchi, Terukatsu. Process for separation of a mixed gas. 4,115,081, Cl. 55-64.000.
Ohshima, Katsutoshi. Method for separating foreign substances by means of a filter forming a floating layer. 4,115,266, Cl. 210-80.000.
Ohta, Koji: *See*—
Wada, Mitsuyoshi; Shimada, Hideyuki; and Ohta, Koji, 4,115,023, Cl. 404-98.000.
Oien, Michael Ackman: *See*—
Ammann, Hans Hugo; and Oien, Michael Ackman, 4,115,601, Cl. 427-96.000.
Oiler, Willard E., to Menasha Corporation. Gold putting cup and flagstick holding assembly. 4,114,879, Cl. 273-34.00R.
Okada, Hisao: *See*—
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.
Okada, Yoshimasa, to Sharp Kabushiki Kaisha. Nonrecorded section detection in a tape recorder apparatus. 4,115,821, Cl. 360-72.000.
Okai, Sakuo; and Tsuchida, Shozo, to Napp Systems (USA), Inc. Shallow relief photopolymer printing plate and methods. 4,115,119, Cl. 96-35.100.
Okai, Sakuo; and Tsuchida, Shozo, to Napp Systems (USA), Inc. Shallow relief photopolymer printing plate and methods. 4,115,123, Cl. 96-79.000.
Okamura, Miyoshi: *See*—
Tsukamoto, Takeo; Okamura, Miyoshi; and Kutami, Toshio, 4,115,211, Cl. 204-37.00R.
Okano, Masami; and Yoshitomi, Shozo, to Okano Valve Seizo Kabushiki Kaisha. Device for automatically lapping wedge-gate valve seat. 4,114,323, Cl. 51-241.0VS.
Okano Valve Seizo Kabushiki Kaisha: *See*—
Okano, Masami; and Yoshitomi, Shozo, 4,114,323, Cl. 51-241.0VS.
Okawa, Taro, to Yoshida Kogyo Kabushiki Kaisha. Thermally and acoustically insulating structure. 4,114,342, Cl. 52-790.000.
Okita, Yasuo: *See*—
Kobayashi, Sadao; and Okita, Yasuo, 4,115,338, Cl. 260-29.4UA.
Okubo, Masao; Miki, Masayoshi; and Ueda, Takeshi, to Sumitomo Chemical Company, Limited. Method for preventing corrosion of a sulfur dioxide regenerating apparatus. 4,115,148, Cl. 134-21.000.
Okura, Keniti, to Pioneer Electronic Corporation. Phonographic pick-up cartridge. 4,114,896, Cl. 274-37.000.
Oldendorf, William Henry, to EMI Limited. Apparatus for identifying computerized axial tomographs. 4,115,691, Cl. 250-312.000.
Olin Corporation: *See*—
Harris, Fred A., 4,114,817, Cl. 241-73.000.
Watts, Herbert L., 4,115,410, Cl. 260-348.250.
Woodard, Kenneth E., Jr.; and Specht, Steven J., 4,115,237, Cl. 204-258.000.
Oliver, Leland Wayne: *See*—
Selvin, Gerald Joseph; Oliver, Leland Wayne; Yamamoto, Stephen Kazuo; and Hogan, Clarence Vaughn, 4,114,976, Cl. 339-217.00S.
Olympus Optical Co., Ltd.: *See*—
Kimura, Tadashi, 4,114,992, Cl. 350-216.000.
Tsunefuji, Katsuhiko, 4,115,790, Cl. 354-60.00R.
Omark Industries, Inc.: *See*—
Pomeroy, Raymond V., 4,114,792, Cl. 227-8.000.
Omura, Hisanori: *See*—
Finlay, Joseph Burton; and Omura, Hisanori, 4,115,481, Cl. 260-900.000.
Onat, Mustafa V. Anti-vomiting, anti-aspirating oral-nasal gastric tube. 4,114,625, Cl. 128-348.000.
Onder, Kemal B., to Upjohn Company, The. Novel copolyamideimides. 4,115,372, Cl. 528-73.000.
O'Neal, Chester L. Sanitary drinking spout for liquid container with tear tab. 4,114,778, Cl. 220-267.000.
O'Neil, Paul L.: *See*—
Lista, Edwin L.; Hartupee, Richard B.; Manfred, Ralph K.; and O'Neil, Paul L., 4,115,166, Cl. 149-7.000.
O'Neill, Robert S. Bale tying device and knot produced thereby. 4,114,527, Cl. 100-2.000.
Onishi, Akiyoshi: *See*—
Otsu, Ikuo; and Onishi, Akiyoshi, 4,114,461, Cl. 74-29.000.

Onishi, Isao: *See*—
Miyachi, Nobuji; Ogawa, Akira; Miyake, Keniti; and Onishi, Isao, 4,114,544, Cl. 112-104.000.
Ono, Yoshihiro: *See*—
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.
Oosawa, Koichi: *See*—
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, 4,114,576, Cl. 123-119.00A.
Oosterling, Pieter Adriaan; and Baecke, Antoine Marinus Rene, to Multinorm, B.V. Agricultural implement. 4,114,814, Cl. 239-689.000.
Opitz, Wolfgang; and Hennen, Hans, to Hoechst Aktiengesellschaft. Production of hydrochloric acid by removing hydrogen chloride from combustion gas. 4,115,531, Cl. 423-488.000.
Oppenlaender, Knut; Seib, Karl; and Krapf, Heinz, to BASF Aktiengesellschaft. Production of water-in-oil emulsions. 4,115,314, Cl. 252-309.000.
Optel Corporation: *See*—
Deb, Satyendra Kumar, 4,115,631, Cl. 429-111.000.
Orain, Michel A., to Glaenzer Spicer. Couplings having sliding splines. 4,115,022, Cl. 403-359.000.
Ordonez, Kathy Palmer: *See*—
Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,115,520, Cl. 423-287.000.
Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,115,521, Cl. 423-294.000.
Orlandini, Orlando Paladino, to Gori & Zucchi S.p.A. Process for producing articles of jewelry, trinketry and the like, made of metals of different colors. 4,114,398, Cl. 63-3.000.
Orlowski, David Chester, to Inpro, Inc. Sealing rings. 4,114,902, Cl. 277-53.000.
Orndorff, James A., Jr.; Wozniak, Robert S.; and Andrepont, John S., to Chicago Bridge & Iron Company. Rigid mooring arm hook-up system. 4,114,556, Cl. 114-230.000.
Oroshnik, William: *See*—
Close, Ralph E.; and Oroshnik, William, 4,115,466, Cl. 260-678.000.
Orscheln Brake Lever Mfg. Company: *See*—
Lipshield, Eugene C., 4,114,718, Cl. 180-89.140.
Orshansky, Betty Bacon, executrix: *See*—
Orshansky, Elias, Jr., deceased; and Weseloh, William E., 4,114,475, Cl. 74-687.000.
Orshansky, Elias, Jr., deceased (by Orshansky, Betty Bacon, executrix); and Weseloh, William E., to Orshansky Transmission Corporation. Hydromechanical transmission with three simple planetary assemblies, one sun gear being mounted on the output shaft and the other two on a common shaft connected to an input-driven hydraulic module. 4,114,475, Cl. 74-687.000.
Orshansky Transmission Corporation: *See*—
Orshansky, Elias, Jr., deceased; and Weseloh, William E., 4,114,475, Cl. 74-687.000.
Orth, Dieter: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,115,456, Cl. 260-613.00R.
Osder, Stephen S.; and Mossman, David C., to Sperry Rand Corporation. Automatic flight control system with operatively monitored digital computer. 4,115,847, Cl. 364-101.000.
Oshima, Yoshimasa: *See*—
Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,115,762, Cl. 340-146.30H.
Ostermayer, Franz: *See*—
Frei, Jorg; Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,115,575, Cl. 424-250.000.
Oswald, Alexis A.; and Lesser, Joseph H., to Exxon Research and Engineering Company. Stereospecific cis- and trans-vinylic phosphorus esters. 4,115,482, Cl. 260-957.000.
Otaki, Haruo: *See*—
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.
Otani, Sugio; Watanabe, Shoji; and Araki, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Production of carbon fibers having high anisotropy. 4,115,527, Cl. 423-447.400.
Otis Elevator Company: *See*—
Faup, John Joseph; and Wolf, David Harvey, 4,114,731, Cl. 187-29.00R.
Oto, Takao R., to Roto Manufacturing Co., Inc. Protective boot. 4,114,460, Cl. 74-18.200.
Otsu, Ikuo; and Onishi, Akiyoshi, to Toyoda-Koki Kabushiki Kaisha. Lever-operated feed device. 4,114,461, Cl. 74-29.000.
Ott, Edward; and Manheimer, Wallace M., to United States of America, Navy. Tokamak plasma heating with intense, pulsed, ion beams. 4,115,191, Cl. 176-3.000.
Otte, Wilhelm; Bergmann, Gunther; and Kubitza, Kar-Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for dehydrating suspension. 4,115,265, Cl. 210-68.000.
Ottenweller, Donald T.: *See*—
Jones, Harold E.; and Ottenweller, Donald T., 4,114,333, Cl. 52-265.000.
Outboard Marine Corporation: *See*—
Morris, Richard L., 4,114,354, Cl. 56-295.000.
Overseas Containers Australia Pty Limited: *See*—
Langsford, Stephen Walter, 4,115,020, Cl. 403-322.000.
Owen, Ronald P.: *See*—
Miller, George A.; and Owen, Ronald P., 4,115,578, Cl. 424-273.00R.
Owens-Corning Fiberglas Corporation: *See*—
Kissell, Ronald E.; and Gambill, Ulysses T., 4,115,498, Cl. 264-119.000.
Miller, Ward B., 4,114,530, Cl. 100-87.000.
Owens-Illinois, Inc.: *See*—
Aust, John J., 4,114,755, Cl. 206-326.000.
Cuniberti, Mario; and Pinsenschaum, Edwin C., 4,114,769, Cl. 214-152.000.
Go, Santos W., 4,115,363, Cl. 528-294.000.
Krall, Thomas J., 4,115,496, Cl. 264-94.000.
Stoll, Andrew Joseph, III, 4,114,779, Cl. 220-288.000.
Taylor, Lynn J., 4,115,599, Cl. 427-55.000.
Oyama, Shoji, to Kuniko Saita. Hand truck. 4,114,916, Cl. 280-47.290.
Oyama, Tetsuo: *See*—
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.
Oye, Lloyd J.; and Ogden, Barry, to Trans-Aid Corporation. Medication dispensing cart. 4,114,965, Cl. 312-209.000.
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, to Nippon Mining Co., Ltd; and Hitachi, Ltd. Catalyst for treating heavy oils. 4,115,324, Cl. 252-459.000.
P.R. Mallory & Co. Inc.: *See*—
Dey, Arabinda N.; and Him, James H., 4,115,629, Cl. 429-56.000.
Paakkinen, Ilmari; Hakkinen, Seppo; and Matula, Jouni, to Enso-Gutzeit Osakeyhtio. Disk refiner. 4,114,818, Cl. 241-244.000.
Pac-Craft Products, Inc.: *See*—
Clark, Albert L., 4,114,854, Cl. 254-122.000.
Paccar Inc.: *See*—
Saunders, James Warren, 4,114,719, Cl. 180-90.000.
Pacific Adhesives, Inc.: *See*—
Cone, Charles N.; and Steinberg, Julius M., 4,115,178, Cl. 156-291.000.
Packer, Marvin, to RCA Corporation. Organic welding flax composition. 4,115,157, Cl. 148-23.000.
Padalko, Oleg Vadimovich; Levit, Maxim Lvovich; and Voinov, Nikolai Vasilievich. Porous material for making tool-electrode and method of producing same. 4,115,623, Cl. 428-566.000.
Pai, Damodar M.: *See*—
Stolka, Milan; Pai, Damodar M.; and Yanus, John F., 4,115,116, Cl. 96-1.50R.
Paitson, John Lloyd; and Parker, Marion Lonnie, to Western Geophysical Co. of America. Pneumatic seismic signal generator with independent firing control pressure. 4,114,723, Cl. 181-120.000.
Pako Corporation: *See*—
Jensen, Gerald A.; Larson, Louis A.; and Diesch, Robert E., 4,114,349, Cl. 53-54.000.
Pakradooni, Hamlin Andrus, to Webster Spring Co. Inc. Coil spring assembly. 4,114,867, Cl. 267-97.000.
Pallos, Ferenc M.: *See*—
Lam, Hsiao-Ling; and Pallos, Ferenc M., 4,115,582, Cl. 424-298.000.
Panetti, Romolo, to Speno International S.A. Process and apparatus for on-track truing of the heads of rails of a railway. 4,115,857, Cl. 364-474.000.
Pantone, Richard S.: *See*—
Reiff, Helmut F.; and Pantone, Richard S., 4,115,429, Cl. 260-453.0SP.
Papst-Motoren KG: *See*—
Muller, Rolf, 4,115,715, Cl. 310-68.00B.
Parisien, Rudolph E. Fence system. 4,114,860, Cl. 256-65.000.
Parker-Hannifin Corporation: *See*—
Jelinek, Jerry G., 4,114,906, Cl. 277-166.000.
Parker, Marion Lonnie: *See*—
Paitson, John Lloyd; and Parker, Marion Lonnie, 4,114,723, Cl. 181-120.000.
Parker, Robert H.: *See*—
Hofferber, Henry E.; and Parker, Robert H., 4,114,842, Cl. 244-180.000.
Parkin, Ann: *See*—
Poller, Robert Clive; and Parkin, Ann, 4,115,094, Cl. 71-88.000.
Parlec, Inc.: *See*—
Lutz, Peter M., 4,114,918, Cl. 280-284.000.
Parsi, Edgardo J., to Ionics, Inc. Electrodialysis cell electrode reversal and anolyte recirculation system. 4,115,225, Cl. 204-180.00P.
Partnership of W. L. Boehler and A. G. Whaley Co., Inc., The: *See*—
Boehler, William L., 4,114,829, Cl. 242-157.00R.
Partridge, John Joseph, Jr.: *See*—
Chadha, Naresh Kumar; Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,115,452, Cl. 260-586.00R.
Paschal, Gloria C.: *See*—
Thompson, Gerald L.; and Paschal, Gloria C., 4,115,388, Cl. 260-287.00B.
Pasieka, Arnold Roy; Wilson, John Corner; and Moruzi, George Alexander, to Falconbridge Nickel Mines Limited'. Hydraulic hoisting. 4,114,954, Cl. 302-14.000.
Patenaude, Raymond Arthur, to General Electric Company. Endless conveyor mechanism. 4,114,511, Cl. 89-33.0CA.
Paterson, David, to U.S. Philips Corporation. Pump for pumping liquid in a pulse-free flow. 4,115,036, Cl. 417-322.000.

Patik, Leonid Ozerovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Patrie, Jos; and Colombier, Gabriel, to Societe de Vente de l'Aluminium Pechiney. Electrolytic coloring process for non anodized aluminum and its alloys. 4,115,212, Cl. 204-38.00E.

Patterson, Marvin LeRoy; Haselby, Robert Dale; and Kendig, Albert Prall, to Hewlett-Packard Company. Open-loop electric drive with corrective controller. 4,115,726, Cl. 318-171.000.

Patton, Bobbie J.; Sexton, James H.; Gravley, Wilton; and Foster, C. Mackay, Jr., to Mobil Oil Corporation. Well drilling system. 4,114,435, Cl. 73-151.500.

Patzelt, Heinz Wolfgang: *See—*
Schneider, Gottfried; Wagner, Kuno; and Patzelt, Heinz Wolfgang, 4,115,298, Cl. 260-2.300.

Paul Mueller Company: *See—*
Mueller, Paul; and Prine, Ray A., 4,114,686, Cl. 165-110.000.

Paul, Rolf; and Menschik, Judith, to American Cyanamid Company. Imidazo-[1,5-d]-as-triazin-1(2H)-ones and method of ameliorating asthma. 4,115,572, Cl. 424-249.000.

Pauliukonis, Richard S. Adjustable self-reciprocating operator. 4,114,515, Cl. 91-284.000.

Pauliukonis, Richard S. Directional valves with thermo-electric operators. 4,114,645, Cl. 137-596.170.

Paulus, Helmut, to Saint-Gobain Industries. Cutting device with rotating cutters. 4,114,493, Cl. 83-488.000.

Pavlecka, Vladimir H.; and McIntyre, David G., to Skagit Corporation. Air transport and lifting vehicle. 4,114,837, Cl. 244-26.000.

Pavlovsky, Rudolf; and Wuest, Heinz, to Georg Fischer Aktiengesellschaft. Method of and device for clamping a workpiece. 4,114,281, Cl. 33-180.00R.

Pawlik, Dieter; and Zschauer, Karl-Heinz, to Siemens Aktiengesellschaft. Process for the production of epitaxial layers on monocrystalline substrates by liquid-phase-slide epitaxy. 4,115,162, Cl. 148-171.000.

Pawloski, Chester E., to Dow Chemical Company, The. Substituted pyridinyl O-alkyl phenyl/phosphonothioates and their use as pesticides. 4,115,557, Cl. 424-200.000.

Payre, Michel: *See—*
Muraz, Jean-Max; Payre, Michel; and Rampin, Pierre, 4,114,438, Cl. 73-194.00A.

Payton, Joy T., to Texaco Inc. Systems for producing bitumen from tar sands. 4,114,687, Cl. 166-51.000.

Payton, Joy T., to Texaco Inc. Method for controlling sand in thermal recovery of oil from tar sands. 4,114,691, Cl. 166-276.000.

Peachtree Doors, Inc.: *See—*
Governale, Bernard C., 4,114,319, Cl. 49-488.000.

Pedersen, Erik, to Nordisk Insulinlaboratorium. Method of isolation and recovery of protein hormones, deriving from pituitary tissues using polyethylene glycol. 4,115,375, Cl. 260-112.00R.

Pedersen, Vernon G.: *See—*
Bohmrich, Jack L.; Bowden, William A., Jr.; and Pedersen, Vernon G., 4,114,389, Cl. 405-186.000.

Pelifian, Lenny M. Device for cancelling inside force of pickup arm of record player. 4,114,894, Cl. 274-23.00R.

Pellar, Marshall. Method for maintaining uniform level of anti-oxidant in heated cooking oil. 4,115,597, Cl. 426-541.000.

Pelletier, Albert: *See—*
McKerrow, George C.; Pelletier, Albert; and Fowler, Peter L., 4,114,865, Cl. 266-136.000.

Pelton & Crane Company: *See—*
Jones, Arthur Lee, 4,114,274, Cl. 32-22.000.
Jones, Arthur Lee; and Leffler, Dennis Frank, 4,114,275, Cl. 32-22.000.
McGaha, George Vernon, 4,114,273, Cl. 32-22.000.

Pendell, Larry Stuart. Method of forming flat four-sided fastener parts having an opening therein. 4,114,218, Cl. 10-86.00R.

Penn, Nathar W. Compositions and method of employing the same for inhibiting alcohol intoxication. 4,115,576, Cl. 424-251.000.

Pennwalt Corporation: *See—*
Bohen, Joseph Michael; and Toukan, Sameeh Said, 4,115,352, Cl. 260-45.75B.
McKellin, Wilbur H.; and Swarts, William A., 4,115,455, Cl. 260-610.00R.

Pepsico, Inc.: *See—*
Morris, Frank R.; and Alberghini, Alfred C., 4,114,347, Cl. 53-300.000.

Perenco Limited: *See—*
Sharpe, Charles William Scott, 4,114,470, Cl. 74-441.000.

Perkey, R. V. Otis. Auto headrest. 4,114,948, Cl. 297-397.000.

Perkins, Donald Leroy; and Streckenbach, Bruce Lindsay, to Boeing Company, The. Swaged tube coupling. 4,114,930, Cl. 285-334.500.

Perkinson, Leon Raymond: *See—*
Moore, Francis Claudell; and Perkinson, Leon Raymond, 4,114,620, Cl. 128-254.000.

Perl, Martin M.: *See—*
Schoenholz, Daniel; and Perl, Martin M., 4,115,293, Cl. 252-102.000.

Perlegos, George: *See—*
Salsbury, Phillip J.; Perlegos, George; and Morgan, William L., 4,114,255, Cl. 29-571.000.

Perlin, Boris Abramovich: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Dyestuff salts. 4,115,379, Cl. 260-163.000.

Perry, Malcolm B.: *See—*
Wallace, Rebecca; Ashton, Fraser E.; Perry, Malcolm B.; and Diena, Benito B., 4,115,543, Cl. 424-8.000.

Peslerbe, Gilbert: *See—*
Bonnemay, Maurice; Bronoel, Guy; Angely, Lysiane; and Peslerbe, Gilbert, 4,115,628, Cl. 429-44.000.

Pet Foods: *See—*
Soran, Robert L., 4,114,526, Cl. 99-533.000.

Petersein, Helmut: *See—*
Kienel, Gerhard; and Petersein, Helmut, 4,115,653, Cl. 13-31.000.

Petersen, Poul, to Danfoss A/S. Cable clamp. 4,114,846, Cl. 248-68.0CB.

Petershack, Victor D., to Rexnord Inc. Snap-on wear pad. 4,114,467, Cl. 74-255.00R.

Petillo, Phillip J., to Ambico Inc. Drumstick. 4,114,503, Cl. 84-422.00S.

Petitpierre, Jean Claude: *See—*
Garner, Robert; and Petitpierre, Jean Claude, 4,115,450, Cl. 260-558.00A.

Petroff, Robert J. Lead screw tapping unit. 4,115,025, Cl. 408-6.000.

Pfaff Industriemaschinen GmbH: *See—*
Kirch, Otto; and Willenbacher, Erich, 4,114,546, Cl. 112-153.000.

Pfeifer, Josef: *See—*
Darms, Roland; Pfeifer, Josef; and Kvita, Vratislav, 4,115,359, Cl. 528-170.000.
Roth, Martin; Darms, Roland; and Pfeifer, Josef, 4,115,368, Cl. 528-229.000.

Pfeiffer, Paul: *See—*
Metz, Paul; Schockmel, Robert; Nick, Desire; and Pfeiffer, Paul, 4,115,089, Cl. 65-19.000.

Pfister, Barry Lee. Combination leveling and grade checking tool. 4,114,220, Cl. 15-105.000.

Pfizer Inc.: *See—*
Barth, Wayne E., 4,115,385, Cl. 260-239.100.

Pharmacia Fine Chemicals AB: *See—*
Rothman, Ulf Sven Erik; Kagedal, Sven Lennart; and Soderberg, John Lennart, 4,115,536, Cl. 424-1.000.

Phelps, Orville E., to Dana Corporation. Universal joint. 4,114,404, Cl. 64-17.00A.

Philagro S.A.: *See—*
Lacroix, Guy; Debourge, Jean-Claude; and Ducret, Jacques, 4,115,559, Cl. 424-209.000.

Phillips, Ash S. Chlorinator for swimming pools. 4,115,270, Cl. 210-169.000.

Phillips, Howard Charles: *See—*
Loomis, Phillip Eugene; Martz, Paul Elwood; and Phillips, Howard Charles, 4,114,253, Cl. 29-566.200.

Phillips Petroleum Company: *See—*
Baldwin, Bernard A.; Williams, Ralph P.; and Rohde, Raymond, 4,115,286, Cl. 252-46.300.
Bost, Howard W., 4,115,349, Cl. 260-45.8NT.
Brady, Donnie G., 4,115,344, Cl. 260-37.00R.
Cines, Martin R., 4,115,524, Cl. 423-415.00A.
Fahey, Darryl R.; and Mahan, John E., 4,115,470, Cl. 260-683.15D.
Gragson, James T.; and Ballard, Joseph E., 4,115,562, Cl. 264-234.000.
Hughes, James K., 4,115,508, Cl. 264-310.000.
McCarthy, William C.; and Dunn, Robert O., 4,115,264, Cl. 210-63.00R.
Murtha, Timothy P.; and Zuech, Ernest A., 4,115,204, Cl. 203-60.000.
Murtha, Timothy P., 4,115,205, Cl. 203-60.000.
Murtha, Timothy P., 4,115,206, Cl. 203-60.000.
Murtha, Timothy P., 4,115,207, Cl. 203-60.000.
Murtha, Timothy P., 4,115,463, Cl. 260-668.00B.
Needham, Donald G., 4,115,283, Cl. 252-12.400.
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., 4,115,335, Cl. 260-28.5AS.
Stewart, William S., 4,115,862, Cl. 364-500.000.

Phinney, John M., to Falk Corporation, The. Marine propulsion control transfer system. 4,114,745, Cl. 192-0.098.

Phipps, Donald Lee, Jr.; and Wambach, Allen Dale, to General Electric Company. Warp-resistant reinforced thermoplastic compositions comprising polyester resins and zinc stearate. 4,115,333, Cl. 260-22.00R.

Phone-mate, Inc.: *See—*
Haake, Robert, 4,114,834, Cl. 242-200.000.

Picker Corporation: *See—*
Coleman, Eugene W., 4,114,758, Cl. 206-471 000.

Pico Electronics Limited: *See—*
Leach, Leslie Alan; Riddoch, Henry Jamieson; and Duffy, Neil David, 4,114,893, Cl. 274-9.0RA.

Pico, Francisco Antonio, deceased; and Shanley, James J., personal representative. Manufacture of abrasion-resistant screening apparatus. 4,115,507, Cl. 264-267.000.

Pied, Jean-Philippe, to Societe des Plastiques de Carmaux Scasar. Polyolefin compositions. 4,115,347, Cl. 260-42.460.
Pierce Chemical Company: *See*—
Gindler, E. Melvin, 4,115,064, Cl. 23-230.00B.
Pierson, Marvin B.: *See*—
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,114,563, Cl. 118-63.000.
Pigerol, Charles: *See*—
Nanthavong, Souli; Pigerol, Charles; Eymard, Pierre; and Simiand, Jacques, 4,115,401, Cl. 260-326.430.
Piltingsrud, Douglas Howard, to Du Pont de Nemours, E. I., and Company. Process for the preparation of pigmentary bright primrose yellow bismuth vanadate. 4,115,141, Cl. 106-288.00B.
Pinsenschaum, Edwin C.: *See*—
Cuniberti, Mario; and Pinsenschaum, Edwin C., 4,114,769, Cl. 214-152.000.
Pioneer Electronic Corporation: *See*—
Okura, Keniti, 4,114,896, Cl. 274-37.000.
Pioneer Filters, Inc.: *See*—
Swank, Roy L., 4,115,277, Cl. 210-436.000.
Piper, Eldon L. Recycling drain pan. 4,114,644, Cl. 137-565.000.
Pires, H. George. Telephone billing apparatus for a subscription television system. 4,115,807, Cl. 358-122.000.
Pithie, Donald Roy, to Rolls-Royce Motors Limited. Bearings. 4,114,961, Cl. 308-237.00R.
Pitman, Herbert J.; Harrison, Charles W.; and Sequeira, Avilino, to Texaco Inc. Solvent dewaxing process. 4,115,244, Cl. 208-33.000.
Pitman, Herbert J.: *See*—
Harrison, Charles W.; Pitman, Herbert J.; and Sequeira, Avilino, 4,115,243, Cl. 208-33.000.
Sequeira, Avilino; Pitman, Herbert J.; Harrison, Charles W.; and Quasny, Jerry E., 4,115,242, Cl. 208-33.000.
Pitney-Bowes, Inc.: *See*—
Kittredge, Lloyd G., 4,114,533, Cl. 101-99.000.
Pixley, Daniel L.: *See*—
Carlson, Carl S.; Kinsella, Lawrence M.; and Pixley, Daniel L., 4,115,185, Cl. 156-634.000.
Planning Kogyo Kabushiki Kaisha: *See*—
Kojima, Yoichi, 4,114,765, Cl. 214-1.0QC.
Plastics Engineering Company: *See*—
Kellner, Jerome C., 4,115,366, Cl. 528-131.000.
Plattier, Marcel; and Teisseire, Paul Jose, to Societe Anonyme Roure Bertrand Dupont. Perfuming of composition using 3-(10-undecenyloxy)proprionitrile. 4,115,326, Cl. 252-522.000.
Platzer, George E., Jr., to Chrysler Corporation. Electronic spark timing advance controller. 4,114,574, Cl. 123-117.00R.
Platzoeder, Karl, to Siemens Aktiengesellschaft. Semiconductor component having patterned recombination center means with different mean value of recombination centers on anode side from that on cathode side. 4,115,798, Cl. 357-64.000.
Plaut, Werner P. B., to Flexowall Corporation. Compacting apparatus. 4,114,531, Cl. 100-90.000.
Plavskikh, Vladimir Dmitrievich: *See*—
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich, 4,114,700, Cl. 175-19.000.
Plessey Handel und Investments AG: *See*—
Buckner, Ian Wilfrid, 4,115,728, Cl. 318-318.000.
Taylor, Frank Howard, 4,115,777, Cl. 343-108.00R.
Ploeger, Jeanne M.: *See*—
Ploeger, Walter, Jr.; and Ploeger, Jeanne M., 4,115,012, Cl. 400-202.100.
Ploeger, Walter, Jr.; and Ploeger, Jeanne M. Printing ribbon spool. 4,115,012, Cl. 400-202.100.
Pluss, Ernest. Container, particularly for collecting products to be recycled. 4,114,776, Cl. 220-22.000.
Pluzhnov, Stanislav Konstantinovich: *See*—
Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,468, Cl. 260-683.15D.
Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,469, Cl. 260-683.15D.
Pochandke, Winfried: *See*—
Weber, Rudolf; Pochandke, Winfried; and Schwadtke, Karl, 4,114,284, Cl. 34-12.000.
Pockrandt, Gunter; and Fellner, Helmut, to Metallgesellschaft Aktiengesellschaft. Removing pollutants from aqueous liquor used to scrub fuel gasification product. 4,115,079, Cl. 55-43.0BN.
Poe, L. Richard, to Hartwell Corporation. Fastener plunger entry resistance means. 4,114,509, Cl. 85-84.000.
Polaroid Corporation: *See*—
MacLeish, William T.; and Shulman, Joseph, 4,115,618, Cl. 428-204.000.
Polidori, Mario, to UTM Power Products, Inc. Single wedge-type grid wire connector. 4,114,977, Cl. 339-270.00R.
Pollak, Henry M. Guard for belt pulley. 4,114,473, Cl. 74-611.000.
Poller, Robert Clive; and Parkin, Ann, to Research Corporation. Organotin sucrose compounds and method of use. 4,115,094, Cl. 71-88.000.
Polley, Richard B.: *See*—
Wempe, Richard J.; and Polley, Richard B., 4,114,783, Cl. 222-398.000.
Pollitzer, Ernest L.: *See*—
Hayes, John C.; and Pollitzer, Ernest L., 4,115,255, Cl. 208-143.000.
Polythetics, Inc.: *See*—
Colpitts, Ralph W., 4,115,488, Cl. 264-17.000.
Pomeroy, Raymond V., to Omark Industries, Inc. Powder actuated tool. 4,114,792, Cl. 227-8.000.
Poncha, Rustom P.: *See*—
Gancy, Alan B.; and Poncha, Rustom P., 4,115,525, Cl. 423-425.000.
Pond, Stephen F.: *See*—
Frey, Thomas M.; and Pond, Stephen F., 4,115,786, Cl. 346-74.100.
Pont-A-Mousson S.A.: *See*—
Langenfeld, Michel, 4,114,657, Cl. 138-109.000.
Popenoe, Charles H. Radio-frequency tuned-circuit microdisplacement transducer. 4,114,428, Cl. 73-88.00F.
Porter, Samuel, Jr.; and McBane, Bruce N., to PPG Industries, Inc. Urethane coating compositions. 4,115,472, Cl. 260-836.000.
Porubcan, Randolph S.; and Sellars, Robert L., to Chr. Hansen's Laboratory, Inc. Preparation of culture concentrates for direct vat set cheese production. 4,115,199, Cl. 195-96.000.
Poseidon Marketing and Development Co.: *See*—
Lundh, Roy W., 4,114,381, Cl. 405-94.000.
Pospelova, Lidia Mikhailovna: *See*—
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.
Pot, Hendrik, to N.V. Industrieele Handelscombinatie Holland. Seal for unloading hatch of hopper barge or similar vessel. 4,114,901, Cl. 277-34.300.
Potter, Colin: *See*—
Goodacre, John Purefoy; Potter, Colin; and Ball, Peter, 4,114,662, Cl. 141-387.000.
Poulsen, Robert Gordon, to Northern Telecom Limited. Method of plasma etching. 4,115,184, Cl. 156-626.000.
Powell, Robert George, to Harman Brother Limited. Hinge for jewelry and the like. 4,114,238, Cl. 16-157.000.
PPG Industries, Inc.: *See*—
Comperatore, John A., 4,115,090, Cl. 65-25.00A.
Neely, James Edwin, Jr., 4,115,092, Cl. 65-99.00A.
Porter, Samuel, Jr.; and McBane, Bruce N., 4,115,472, Cl. 260-836.000.
Schwenninger, Ernest N.; and Schwenninger, Ronald L., 4,114,444, Cl. 73-359.00R.
Walker, Marvin E., 4,115,088, Cl. 65-11.00W.
Zwack, Robert R.; and Jerabek, Robert D., 4,115,226, Cl. 204-181.00C.
Pralus, Christian: *See*—
Marion, Jacques; and Pralus, Christian, 4,115,434, Cl. 260-465.300.
Pratt, George W., Jr., to Massachusetts Institute of Technology. Apparatus for altering the biological and chemical activity of molecular species. 4,115,280, Cl. 250-527.000.
Pratt, Wayne L., to Avicon Development Group. Temperature monitoring system. 4,114,442, Cl. 73-341.000.
Prentice, Leon Austin, to Tektronix, Inc. Electromagnetic interference shielding device. 4,115,655, Cl. 174-35.00R.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
Remington, Richard Charles, 4,114,235, Cl. 16-139.000.
Preussag Aktiengesellschaft Metall: *See*—
Bartels, Gunter; Immenroth, Horst; and Heyer, Gunter, 4,115,220, Cl. 204-105.00R.
Previati, Augusto, to Industrie Pirelli S.p.A. Process and apparatus for curing elastomeric conveyor belts and the like. 4,115,510, Cl. 264-347.000.
Prince Corporation: *See*—
Marcus, Konrad H., 4,114,986, Cl. 350-282.000.
Prince, Ronald E.; and Bonnette, Rene W., to United States of America, Air Force. Muzzle clamp assembly. 4,114,510, Cl. 89-12.000.
Prine, Ray A.: *See*—
Mueller, Paul; and Prine, Ray A., 4,114,686, Cl. 165-110.000.
Printing Developments, Inc.: *See*—
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, 4,115,816, Cl. 358-283.000.
Probst, Richard O., to Ransburg Corporation. Electrostatic coating apparatus. 4,114,564, Cl. 118-626.000.
Process Shizai Co., Ltd.: *See*—
Inoue, Eiichi; Nose, Taiji; and Inaba, Masakazu, 4,115,613, Cl. 428-207.000.
Procter & Gamble Company, The: *See*—
Guerry, Raymond Ellwood, 4,115,308, Cl. 252-135.000.
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, 4,115,548, Cl. 424-70.000.
Richardson, David L.; and Mueller, Frank J., 4,115,292, Cl. 252-90.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Marion, Jacques; and Pralus, Christian, 4,115,434, Cl. 260-465.300.

Prokai, Bela: *See—*
Sandner, Michael Ray; and Prokai, Bela, 4,115,321, Cl. 252-431.00C.

Prominski, Gunter: *See—*
Coenen, Alfred; Kosswig, Kurt; and Prominski, Gunter, 4,115,530, Cl. 423-488.000.

Puig, Jean-Rene: *See—*
Marchand, Joseph; and Puig, Jean-Rene, 4,115,303, Cl. 521-53.000.

Pullan, Ronald Ernest, to Schlegel(UK) Limited. Door seals. 4,114,320, Cl. 49-491.000.

Purdue Research Foundation: *See—*
Morre, D. James; Kloppel, Thomas M.; and Keenan, Thomas W., 4,115,062, Cl. 23-230.00B.

Purex Corporation: *See—*
Kelly, Virgil M., 4,115,276, Cl. 210-425.000.

Pustka, Karel: *See—*
Mischo, Klaus; Liermann, Traugott; and Pustka, Karel, 4,115,001, Cl. 355-29.000.

Putnam, Hubert P.; and Butts, William O., to Bell & Howell Company. Methods and apparatus for processing data including a characteristic mark or error. 4,115,869, Cl. 364-900.000.

Putney, Richard Knight, to Hercules Incorporated. Rubine mixed strontium-cadmium salts of 3-chloro-4-methyl-6-sulfophenylazo-hydroxynaphthoic acid. 4,115,377, Cl. 260-151.000.

Pyrih, Roman Z.; and Rickard, Robert S., to Earth Sciences, Inc. Vanadium recovery process. 4,115,110, Cl. 75-101.00R.

Qualey, Christian H., to National Distillers and Chemical Corporation. Valve base roughening process. 4,115,173, Cl. 156-120.000.

Quality Measurement Systems, Inc.: *See—*
Rucinski, David W., 4,114,280, Cl. 33-172.00E.

Quang, Pham Kim; and Marckmann, Jean-Claude, to La Cellophane. Electrostatic charge image transfer. 4,115,114, Cl. 96-1.400.

Quasny, Jerry E.: *See—*
Sequeira, Avilino; Pitman, Herbert J.; Harrison, Charles W.; and Quasny, Jerry E., 4,115,242, Cl. 208-33.000.

Queener, Stephen W.; and Nash, Claude H., III, to Eli Lilly and Company. Procedure for obtaining penicillium species mutants with improved ability to synthesize mycophenolic acid. 4,115,197, Cl. 195-36.00R.

Quimco GmbH: *See—*
Hearsey, Colin John, 4,115,445, Cl. 260-553.00A.

Quinn, William T., III. Frame for facial identification system with component reservoir. 4,114,293, Cl. 35-28.000.

Quistorff, Hansjorg: *See—*
Bachhofer, Bruno; Locher, Anton; Skirde, Gerhard; and Quistorff, Hansjorg, 4,115,267, Cl. 210-136.000.

R. G. Dixon & Company Limited: *See—*
Wilkins, John Thomas, 4,114,711, Cl. 180-6.500.

Rabus, Friedrich; Wahl, Josef; and Grather, Gunter, to Robert Bosch GmbH. Voltage limited ignition system, particularly for an internal combustion engine. 4,114,582, Cl. 123-148.00E.

Radiochemical Centre Limited, The: *See—*
Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,115,065, Cl. 23-230.600.

Radner, Gerd; and Zillessen, Christoph, to Ruhrkohle, A.G. Method and device for removing resilient gallery lining frames in mining and tunnelling which consist of a number of section segments inserted one into another in a dissimilar manner. 4,114,386, Cl. 405-150.000.

Raidel, John E. Air spring and beam suspension. 4,114,923, Cl. 280-711.000.

Rajagopalan, Parthasarathi, to Endo Laboratories, Inc. Pyridopyrrolobenzheterocycles. 4,115,577, Cl. 424-256.000.

Ralph M. Parsons Company, The: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,115,075, Cl. 48-197.00R.

Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Azo dyestuffs having a carboxyl group and an iminosulfonamido, iminosulfonylalkyl or iminosulfonylaryl group in the coupling component. 4,115,381, Cl. 260-207.100.

Rampin, Pierre: *See—*
Muraz, Jean-Max; Payre, Michel; and Rampin, Pierre, 4,114,438, Cl. 73-194.00A.

Ramsey, Henry R.: *See—*
Levine, Alexander M.; and Ramsey, Henry R., 4,114,210, Cl. 5-260.000.
Levine, Alexander M.; Ramsey, Henry R.; and Martin, Robert T., 4,114,211, Cl. 5-261.000.

Ransburg Corporation: *See—*
Probst, Richard O., 4,114,564, Cl. 118-626.000.

Rao, Mannige Vikram: *See—*
Libsch, Karl David; and Rao, Mannige Vikram, 4,115,109, Cl. 75-77.000.

Rasmussen, Ole-Bendt. Extrusion method involving rotations. 4,115,502, Cl. 264-173.000.

Rasmussen, Richard L.: *See—*
Buonadonna, Victor R.; Richardson, Ralph J.; Rasmussen, Richard L.; and Jeffers, William Q., 4,115,168, Cl. 149-109.600.

Ratcliffe, Charles T., to Allied Chemical Corporation. Synthesis of hydroxylamine from hydrogen sulfide and nitric oxide. 4,115,523, Cl. 423-387.000.

Rathbun, Richard H.: *See—*
Hildebrandt, William J.; and Rathbun, Richard H., 4,114,268, Cl. 30-262.000.

Raue, Roderich; Eifler, Willi; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Triaryl-methane dyestuffs. 4,115,413, Cl. 260-390.000.

Rautiola, Norman A.: *See—*
Bull, Dale L.; and Rautiola, Norman A., 4,115,844, Cl. 362-382.000.

Ravier, Dominique: *See—*
Bouy, Pierre; and Ravier, Dominique, 4,115,239, Cl. 204-290.00F.

Rawlings, Dennis George, to Automotive Products Limited. Friction clutch cover assemblies. 4,114,742, Cl. 192-89.00B.

Raymond Lee Organization, Inc., The: *See—*
Roseboom, Wayne L., 4,114,888, Cl. 273-176.00L.
Smith, Stanley E., 4,114,292, Cl. 35-9.00B.
Zur, Walter J., 4,114,399, Cl. 63-12.000.

RCA Corporation: *See—*
Catanese, Carmen Anthony; Harrison, James Berkeley, Jr.; and Lindburg, Norman Lee, 4,115,719, Cl. 313-105.00R.
Endriz, John Guiry, 4,115,724, Cl. 315-169.0TV.
Kalfus, Martin Aaron, 4,115,707, Cl. 307-252.00C.
Levine, Jules David, 4,115,720, Cl. 313-337.000.
Liu, Shing-Gong, 4,115,708, Cl. 307-268.000.
Muhlfelder, Ludwig; and Hogan, Robert Benson, 4,114,841, Cl. 244-166.000.
Packer, Marvin, 4,115,157, Cl. 148-23.000.

Rea Magnet Wire Co., Inc.: *See—*
Shelby, Thomas A.; and Gallien, Shelby W., 4,115,342, Cl. 260-33.40P.

Realini, Enrico; and Langenegger, Werner, to Mettler Instrumente AG. Electrical weighing apparatus. 4,114,706, Cl. 177-70.000.

Redford, David A.: *See—*
Cram, Phillip J.; and Redford, David A., 4,114,690, Cl. 166-261.000.

Redin, Alexei Alexandrovich: *See—*
Trubin, Vladimir Fomich; and Redin, Alexei Alexandrovich, 4,114,658, Cl. 139-452.000.

Reed, Clark G.: *See—*
Salmen, Richard A.; and Reed, Clark G., 4,115,801, Cl. 358-93.000.

Reed, Lawrence Paul: *See—*
Baboff, Leon Ian; Shichman, Daniel; and Reed, Lawrence Paul, 4,115,172, Cl. 156-115.000.

Reeder, Marion F. Lathe chuck assembly for holding universal joints. 4,114,910, Cl. 279-123.000.

Reen, Orville W., to Allegheny Ludlum Industries, Inc. Process for producing soft magnetic material. 4,115,158, Cl. 148-31.550.

Reggia, Frank, to United States of America, Army. Broadband hybrid monopole antenna. 4,115,783, Cl. 343-792.000.

Regie Nationale des Usines Renault: *See—*
Theron, Didier, 4,114,715, Cl. 180-64.00A.

Reichle, Walter Thomas: *See—*
Karol, Frederick John; Wu, Chisung; Reichle, Walter Thomas; and Maraschin, Norma Jean, 4,115,425, Cl. 260-438.50R.

Reiff, Helmut F.; and Pantone, Richard S., to Mobay Chemical Corporation. Low-temperature storage stable liquid diphenylmethane diisocyanates. 4,115,429, Cl. 260-453.0SP.

Reilly, Edward Justus: *See—*
Brown, Arling Dix, Jr.; and Reilly, Edward Justus, 4,115,763, Cl. 340-166.00R.

Reinhardt, Klaus: *See—*
Greinacher, Ekkehard; Reinhardt, Klaus; and Strnat, Karl, 4,115,159, Cl. 148-105.000.

Reitz, Norman E., to Sotec Corporation. Sodium thallium type crystal on crystalline layer. 4,115,625, Cl. 428-641.000.

Reliance Electric Company: *See—*
Means, David K.; and Boenke, Clyde A., 4,114,730, Cl. 187-29.00R.

Remington, Richard Charles, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Stay for hinged members. 4,114,235, Cl. 16-139.000.

Remont, Larry Joseph: *See—*
Matson, Lawrence Wayne, Jr.; Nixon, Jeddy Darr, Jr.; and Remont, Larry Joseph, 4,114,703, Cl. 175-107.000.

Rempfler, Hermann: *See—*
Schurter, Rolf; Rempfler, Hermann; and Fory, Werner, 4,115,100, Cl. 71-94.000.

Renner, Karl H.; and Williams, Clark Russell, to Texas Instruments Incorporated. Digital brightness control system. 4,114,366, Cl. 58-50.00R.

Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, to Firmenich SA. Spirane derivatives, their use and process for preparing same. 4,114,630, Cl. 131-17.00R.

Repshis, Vitautas Ionovich: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Research Corporation: *See—*
Freiser, Henry; James, Helen J.; Carmack, Gary; Cattrall, Robert W.; and Kneebone, Barbara M., 4,115,209, Cl. 204-1.00T.
Poller, Robert Clive; and Parkin, Ann, 4,115,094, Cl. 71-88.000.
Subramanian, Gopal; and McAfee, John Gilmore, 4,115,541, Cl. 424-1.500.
Wong, John Lui, 4,115,391, Cl. 260-290.0HL.

Restaino, Alfred J., to Hercules Incorporated. High molecular-weight, water-soluble vinyl polymers. 4,115,339, Cl. 260-29.6HN.

Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., to Phillips Petroleum Company. Asphalt and rubber comprising composition. 4,115,335, Cl. 260-28.5AS.

Rexnord Inc.: *See—*
Petershack, Victor D., 4,114,467, Cl. 74-255.00R.

Reymond, Jean-Claude; and Bellissant, Alain, to Thomson-CSF. Arrangement for detecting light sources. 4,115,006, Cl. 356-152.000.

Rheinische Braunkohlenwerke Aktiengesellschaft: *See—*
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, 4,115,202, Cl. 202-99.000.

Rhodes, William H., to GTE Laboratories Incorporated. Transparent yttria ceramics and method for producing same. 4,115,134, Cl. 106-73.200.

Rhone-Poulenc Industries: *See—*
Bouy, Pierre; and Ravier, Dominique, 4,115,239, Cl. 204-290.00F.
Guillaume, Andre; and Sagi, Ferenc, 4,115,343, Cl. 260-33.6SB.

Rich, Edward Larmour, III: *See—*
Martin, Frank Eugene; and Rich, Edward Larmour, III, 4,115,069, Cl. 422-112.000.

Rich, Walter. Hanger. 4,114,764, Cl. 211-100.000.

Richards, Chester L.: *See—*
Bostick, Hoyt A.; Sutton, Paul M.; and Richards, Chester L., 4,114,978, Cl. 350-1.700.

Richardson, Arthur William, to Furmanite International Limited. Tube plug. 4,114,654, Cl. 138-89.000.

Richardson Corporation: *See—*
Alsberg, Henry; Skalla, Dale W.; and Tirpak, Michael R., 4,115,478, Cl. 260-880.00R.

Richardson, David L.; and Mueller, Frank J., to Procter & Gamble Company, The. Enzyme-containing detergent articles. 4,115,292, Cl. 252-90.000.

Richardson, Ralph J.: *See—*
Buonadonna, Victor R.; Richardson, Ralph J.; Rasmussen, Richard L.; and Jeffers, William Q., 4,115,168, Cl. 149-109.600.

Rickard, Robert S.: *See—*
Pyrih, Roman Z.; and Rickard, Robert S., 4,115,110, Cl. 75-101.00R.

Rickert, Glenn E. Refrigeration evaporator coil with non-frosting fins. 4,114,396, Cl. 62-406.000.

Ricoh Co., Ltd.: *See—*
Kaneko, Yutaka; and Ishida, Tsutomu, 4,114,536, Cl. 101-426.000.

Riddoch, Henry Jamieson: *See—*
Leach, Leslie Alan; Riddoch, Henry Jamieson; and Duffy, Neil David, 4,114,893, Cl. 274-9.0RA.

Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,115,542, Cl. 424-200.000.

Rinella, Pamela A. Process for growing alfalfa sprouts from seed and apparatus therefor. 4,114,315, Cl. 47-61.000.

Ring, Roger R.: *See—*
Thorell, Rook O.; and Ring, Roger R., 4,114,921, Cl. 280-478.00B.

Riverbank Laboratories, Inc.: *See—*
Wohlert, Andrew M.; and Haruch, James, 4,114,305, Cl. 43-17.600.

Rizk, Nabil I. Demand pacemaker with self-adjusting threshold and defibrillating feature. 4,114,628, Cl. 128-419.0PG.

Rizkalla, Nabil, to Halcon International, Inc. Process for preparing carboxylic acid anhydrides. 4,115,444, Cl. 260-549.000.

Rizkalla, Nabil: *See—*
Naglieri, Anthony N.; and Rizkalla, Nabil, 4,115,419, Cl. 260-429.00R.

Robbins, Robert Ralph. Water closet valve assembly. 4,114,642, Cl. 137-436.000.

Robert Bosch GmbH: *See—*
Knapp, Heinrich, 4,114,929, Cl. 285-45.000.
Rabus, Friedrich; Wahl, Josef; and Grather, Gunter, 4,114,582, Cl. 123-148.00E.
Stieringer, Albert; and Borner, Gerhard, 4,114,995, Cl. 352-171.000.
Stumpp, Gerhard, 4,114,579, Cl. 123-139.0AW.
Wurst, Bert, 4,114,581, Cl. 123-148.00E.

Robertson, Donald Keir. Container companion plate. 4,114,768, Cl. 214-152.000.

Robertson, Harry H., to Ameron, Inc. Anchoring system for prestressed concrete pipe. 4,114,332, Cl. 52-224.000.

Robins, Janis; Kropp, James E.; and Young, Chung I., to Minnesota Mining and Manufacturing Company. Polymerizable compositions containing highly fluorinated aliphatic sulfonyl protonic acid catalyst. 4,115,295, Cl. 528-90.000.

Robinson, Frank D., to Robinson Helicopter Co. Control stick assembly. 4,114,843, Cl. 244-84.000.

Robinson, Graham Ernest: *See—*
Bowler, Jean; and Robinson, Graham Ernest, 4,115,580, Cl. 424-278.000.

Robinson Helicopter Co.: *See—*
Robinson, Frank D., 4,114,843, Cl. 244-84.000.

Robinson, Howard Keith; and Robinson, Larry Keith. Sewage relief valve. 4,114,641, Cl. 137-430.000.

Robinson, Larry Keith: *See—*
Robinson, Howard Keith; and Robinson, Larry Keith, 4,114,641, Cl. 137-430.000.

Robinson, William M.; and Lobo, Edward, to Cornell-Dubilier Electric Corp. Dielectric composition and device containing same. 4,115,834, Cl. 361-318.000.

Rockett, Thomas J.; and O'Connell, John J., to American Hospital Supply Corporation. Method for dental restoration. 4,115,487, Cl. 264-16.000.

Roe, Gerald J., to Bethlehem Steel Corporation. Low carbon high yield and tensile strength steel and method of manufacture. 4,115,155, Cl. 148-12.00F.

Roeder, Robert S.; and Bomar, Lucien C., II, to Sperry Rand Corporation. Adaptive gain control for radiometric target tracking system. 4,115,776, Cl. 343-100.0ME.

Rogen, Neil E., to Nicoa Corporation. Temperature monitoring. 4,114,559, Cl. 116-114.500.

Rogerson, Jerry B.; and Harrison, Robert S., to Ford Motor Company. Carburetor choke positive closure mechanism. 4,114,584, Cl. 123-179.00G.

Rohde, Raymond: *See—*
Baldwin, Bernard A.; Williams, Ralph P.; and Rohde, Raymond, 4,115,286, Cl. 252-46.300.

Rohm and Haas Company: *See—*
Avery, Noyes L., 4,115,260, Cl. 210-34.000.
Carlson, Glenn R., 4,115,101, Cl. 71-94.000.
Cenci, Harry J.; and Swift, Graham, 4,115,637, Cl. 526-56.000.
Emmons, William D.; Kim, Samuel S.; and Winey, Donald A., 4,115,169, Cl. 156-71.000.
Miller, George A.; and Owen, Ronald P., 4,115,578, Cl. 424-273.00R.
Nyi, Kayson; and Graham, Sandra I., 4,115,232, Cl. 204-159.230.

Rohner AG Pratteln: *See—*
Kirner, Hans Dieter; Bitterlin, Albert; and Muller, Ekkehard Walter, 4,115,055, Cl. 8-26.000.

Rohr, Otto, to Ciba-Geigy Corporation. 2-Methyl-3-nitrobenzoic acid (2'-cyanoethyl) ester. 4,115,430, Cl. 260-465.00D.

Rohrmoser, Howard L.: *See—*
Clark, Michael J.; and Rohrmoser, Howard L., 4,115,080, Cl. 55-54.000.

Rolls-Royce Motors Limited: *See—*
Pithie, Donald Roy, 4,114,961, Cl. 308-237.00R.

Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Centrifuge tube enclosure. 4,114,803, Cl. 233-26.000.

Romic, Ivica, to W. Schlafhorst & Co. Knotting device. 4,114,931, Cl. 289-2.000.

Roquette Freres: *See—*
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, 4,115,146, Cl. 127-38.000.

Roseboom, Wayne L., to Raymond Lee Organization, Inc., The, a part interest. Golf tour game. 4,114,888, Cl. 273-176.00L.

Rosenkaimer, Siegfried, to Ruko of Canada Ltd. Sheath for knife with dead blade. 4,114,787, Cl. 224-2.00D.

Rosenkranz, Hans Jurgen: *See—*
Elfert, Klaus; Rosenkranz, Hans Jurgen; and Rudolf, Hans, 4,115,465, Cl. 260-674.00R.

Ross, Camilla Brems: *See—*
Higgins, Thomas Engel; Ross, Camilla Brems; and Snella, Henry John, 4,115,594, Cl. 426-140.000.

Ross, Sigmund Lance; Shuffman, Oscar, deceased; and by Shuffman, Rose, executrix. Cryothermal manipulation of petroleum. 4,114,552, Cl. 114-227.000.

Rossi, Alberto; and Egli, Christian, to Ciba-Geigy AG. Process for the manufacture of new carboxylic acids. 4,115,416, Cl. 260-413.000.

Roszkowski, Theodore R.: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,115,075, Cl. 48-197.00R.

Roth, Martin; Darms, Roland; and Pfeifer, Josef, to Ciba-Geigy Corporation. Crosslinkable polymers of compounds containing 5-maleimidyl-isophthalic acid derivatives. 4,115,368, Cl. 528-229.000.

Rothe, Werner: *See—*
Frohling, Hans-Joachim; and Rothe, Werner, 4,114,777, Cl. 229-44.0CB.

Rothman, Ulf Sven Erik; Kagedal, Sven Lennart; and Soderberg, John Lennart, to Pharmacia Fine Chemicals AB. Agent for intravascular administration. 4,115,536, Cl. 424-1.000.

Roto Manufacturing Co., Inc.: *See—*
Oto, Takao R., 4,114,460, Cl. 74-18.200.

Rouaud, Christian: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,114,907, Cl. 277-206.00R.

Rowe, Don H.; and Sasnett, Michael W., to GTE Sylvania Incorporated. Arc detection and control apparatus. 4,115,828, Cl. 361-1.000.

Roy, Henry A.; and D'Angelo, George J. Prosthetic valve assembly for use in cardiovascular surgery. 4,114,202, Cl. 3-1.500.

Royal Cake Company: *See—*
Welch, Gray Gurney, 4,114,524, Cl. 99-450.400.

Royal Industries, Inc.: *See—*
Mugler, Leon B., 4,115,257, Cl. 209-291.000.
Thiele, Carl L.; and Shapiro, Haskell, 4,115,007, Cl. 356-155.000.

Rozell, James O., to Harris Data Communications, Inc. Microprogrammed controller. 4,115,852, Cl. 364-200.000.

Rubino, Andrew M.; and Margres, Jack J., to Armour Pharmaceutical Company. Antacid tablets. 4,115,553, Cl. 424-155.000.

Rucinski, David W., to Quality Measurement Systems, Inc. Digital electronic indicator. 4,114,280, Cl. 33-172.00E.

Rudolf, Hans: *See—*
Elfert, Klaus; Rosenkranz, Hans Jurgen; and Rudolf, Hans, 4,115,465, Cl. 260-674.00R.

Ruf, Max. Means for controlling the oil cooling of the piston of a piston engine. 4,114,571, Cl. 123-41.350.

Ruhrkohle, A.G.: *See—*
Radner, Gerd; and Zillessen, Christoph, 4,114,386, Cl. 405-150.000.

Ruko of Canada Ltd.: *See—*
Rosenkaimer, Siegfried, 4,114,787, Cl. 224-2.00D.

Runte, Robert Ralph: *See—*
Mau, Theodore A., 4,114,882, Cl. 273-85.00G.

Russell, Richard, to U.S. Blind Stitch Machine Corp. Stitch shortening and tacking assembly. 4,114,547, Cl. 112-178.000.

Russo, Ronald D., to Chesebrough-Pond's Inc. Inhalation device. 4,114,607, Cl. 128-2.080.

Russo, Ronald D., to Chesebrough-Pond's Inc. Inhalation device. 4,114,608, Cl. 128-2.080.
Rutherford, Dennis Franklin, to Dowty Mining Equipment Limited. Mine roof support. 4,114,387, Cl. 405-293.000.
Ryan, Charles W.: *See—*
Blanchard, William B.; and Ryan, Charles W., 4,115,403, Cl. 260-340.90R.
Ryan, James Walter; and Chung, Alfred. Substrates for angiotensin converting enzyme. 4,115,374, Cl. 260-112.50R.
Ryan, Ralph L.: *See—*
Taitel, Charles M.; and Ryan, Ralph L., 4,114,909, Cl. 279-1.00Q.
Saab-Scania Aktiebolag: *See—*
Norlin, Stig Ivar, 4,114,937, Cl. 293-85.000.
Saam, Ulrich: *See—*
Berges, Dietrich; Damzog, Bodo; and Saam, Ulrich, 4,114,361, Cl. 57-156.000.
Sablan, Francisco C.: *See—*
Sibley, Clarence E.; and Sablan, Francisco C., 4,114,839, Cl. 244-118.00R.
Sacco, John A.: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,114,260, Cl. 29-623.100.
Sachs, Howard George: *See—*
Dantzler, Danny M.; Meehan, James Bartley; Everman, Wayne Fredrick; Fluent, Donald E.; and Sachs, Howard George, 4,115,779, Cl. 343-715.000.
Sadomov, Jury Borisovich: *See—*
Vladimirov, Evgeny Evgenievich; Korchagin, Vladimir Gerasimovich; Sadomov, Jury Borisovich; and Khokhlov, Lev Mikhailovich, 4,115,867, Cl. 364-900.000.
Safeguard Automotive Corporation: *See—*
Schlenker, H. Oscar, 4,114,400, Cl. 64-3.000.
Sagi, Ferenc: *See—*
Guillaume, Andre; and Sagi, Ferenc, 4,115,343, Cl. 260-33.6SB.
Saint-Gobain Industries: *See—*
Bourggraff, Robert; and Coulon, Jean-Claude, 4,115,091, Cl. 65-99.00A.
Paulus, Helmut, 4,114,493, Cl. 83-488.000.
Saint-Lebe, Louis; Berger, Gerard; Michel, Jean-Pierre; Huchette, Michel; and Fleche, Guy, to Commissariat a l'Energie Atomique; and Roquette Freres. Process for the depolymerization of starch by irraciation and products so obtained. 4,115,146, Cl. 127-38.000.
Saitoh, Shigeru. Self-powered toy animal with openable and closable eyes. 4,114,310, Cl. 46-104.000.
Sakabe, Yukio; and Seno, Hiroshi, to Murata Manufacturing Co., Ltd. Method for making a monolithic ceramic capacitor employing a non-reducing dielectric ceramic composition. 4,115,493, Cl. 264-61.000.
Sakai, Masaaki: *See—*
Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, 4,114,358, Cl. 57-51.000.
Sakai, Yasuo; Nakagawa, Yasuhiko; and Nakajima, Yasuo, to Nissan Motor Company, Limited. Internal combustion engine having siamesed exhaust ports and an aftercombustion chamber. 4,114,373, Cl. 60-282.000.
Sakamoto, Hiroshi: *See—*
Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, 4,114,243, Cl. 29-25.140.
Sakamoto, Hitoshi, to Sony Corporation. Color video signal recording and/or reproducing apparatus. 4,115,800, Cl. 358-8.000.
Sakasai, Toshio: *See—*
Noda, Fumio; Mogi, Keitaro; and Sakasai, Toshio, 4,115,591, Cl. 426-7.000.
Sakashita, Nobuyuki: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,115,102, Cl. 71-94.000.
Sakata, Minehiro: *See—*
Kogiso, Masahiro; Sakata, Minehiro; Oda, Hatsuo; and Iwamoto, Tamio, 4,114,999, Cl. 355-10.000.
Sakaue, Yoshiaki: *See—*
Matsuda, Munekazu; and Sakaue, Yoshiaki, 4,114,572, Cl. 123-59.0PC.
Sakura, Masakazu: *See—*
Fujii, Hideo; Fujiki, Tokio; Uemura, Masaru; and Sakura, Masakazu, 4,115,181, Cl. 156-497.000.
Sakurai, Hidekazu: *See—*
Suzuki, Etsuo; and Sakurai, Hidekazu, 4,115,817, Cl. 358-288.000.
Sakurai, Hideki: *See—*
Hiiro, Takeshi; Sakurai, Hideki; and Kondo, Fumihiko, 4,115,426, Cl. 260-448.20E.
Salimbeni, Aldo: *See—*
Manghisi, Elso; Salimbeni, Aldo; and Ferni, Giovanni, 4,115,585, Cl. 424-311.000.
Salmen, Richard A.; and Reed, Clark G., to Goodyear Aerospace Corporation. Optical image correlator tracking filter circuit. 4,115,801, Cl. 358-93.000.
Salsbury, Phillip J.; Perlegos, George; and Morgan, William L., to Intel Corporation. Floating gate storage device and method of fabrication. 4,114,255, Cl. 29-571.000.
Salyer, Ival O.; and North, Charles J., to Monsanto Research Corporation. Large void-free polyethylene castings. 4,115,499, Cl. 264-122.000.
Sampat, Ajit: *See—*
Jordan, Charles H.; and Sampat, Ajit, 4,115,086, Cl. 62-28.000.
Sampson, Arthur R. Wind powered hydraulic heating system. 4,114,809, Cl. 237-1.00A.
Sandelman, Robert L. Perpetual calendar. 4,114,298, Cl. 40-110.000.
Sanders Associates, Inc.: *See—*
Aitel, Moe Lawrence, 4,115,656, Cl. 174-35.0MS.
Schwartz, Jacob; and Misek, Victor A., 4,114,685, Cl. 165-96.000.
Sanders, Julian V., to Caterpillar Tractor Co. Housing apparatus. 4,114,716, Cl. 180-68.00R.
Sanders, Virgil E.: *See—*
Hutchings, Thomas J.; and Sanders, Virgil E., 4,115,004, Cl. 356-106.0LR.
Sandler, Benzion, to Ben Gurion University of the Negev Research & Development Authority. Accelerometer sensor. 4,114,453, Cl. 73-517.00R.
Sandlin, Joseph P. Tilting attachment for a bed. 4,114,209, Cl. 5-62.000.
Sandner, Michael Ray; and Prokai, Bela, to Union Carbide Corporation. Catalyst systems containing N,N-dimethylaminoalkoxypropionitriles for polyurethane foam formulation. 4,115,321, Cl. 252-431.00C.
Sandoz Ltd.: *See—*
Wiedemann, Achim, 4,115,457, Cl. 260-615.00B.
Sands, Jessie E. Welder's helmet lens. 4,114,198, Cl. 2-8.000.
Saner, Kaspar, to K-Tron Soder AG. Conveyor type scale. 4,114,708, Cl. 177-145.000.
Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, to Matsushita Electric Industrial Co., Ltd. Power amplifier. 4,115,739, Cl. 330-263.000.
Sanson, Joseph F., to Upjohn Company, The. Cushion or seat structure of plastic foam with integrated cover and incorporated reinforcing grid or skeleton, and method of making same. 4,115,170, Cl. 156-79.000.
Santala, Teuvo J.; and Hirsbrunner, Hans G., to Texas Instruments Incorporated. Electrical contact material. 4,115,325, Cl. 252-514.000.
Santo, Philip J. Unitary accessory control for a waterbed. 4,114,215, Cl. 5-370.000.
Sanyo Chemical Industries, Ltd.: *See—*
Tominaga, Yoichi; and Shibahara, Yasuo, 4,115,331, Cl. 260-17.4CL.
Saragossi, Albert. Process for the manufacture of dental prostheses. 4,114,272, Cl. 32-8.000.
Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 4,114,459, Cl. 74-10.410.
Saruwatari, Minoru, to Canadian Foremost Ltd. Pump jack device. 4,114,375, Cl. 60-372.000.
Sasano, Mitsunori: *See—*
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, 4,114,576, Cl. 123-119.00A.
Sasaya, Hideaki: *See—*
Inagaki, Mitsuo; Sasaya, Hideaki; and Kurahashi, Takashi, 4,115,030, Cl. 416-93.00R.
Sasnett, Michael W.: *See—*
Rowe, Don H.; and Sasnett, Michael W., 4,115,828, Cl. 361-1.000.
Satellite Business Systems: *See—*
Schmidt, William G., 4,115,661, Cl. 179-15.0BS.
Sato, Heihachi; and Kohji, Toda. Optical modulator using a controllable diffraction grating. 4,115,747, Cl. 331-94.50M.
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, to Dainippon Ink & Chemicals Inc.; and Kawamura ainstitute of Chemical Research. Liquid crystalline composition. 4,115,310, Cl. 252-299.000.
Sato, Kotaro: *See—*
Kubotera, Kikuo; Kashiwabara, Akira; and Sato, Kotaro, 4,115,118, Cl. 96-33.000.
Sato, Seiichi: *See—*
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.
Satoh, Kenji: *See—*
Tachikawa, Hajime; and Satoh, Kenji, 4,115,678, Cl. 219-10.55B.
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, to Yamasu Shoyu Kabushiki Kaisha. Assay kit for cAMP and/or cGMP and method of using the same. 4,115,538, Cl. 424-1.000.
Satomi, Yoshihito: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.
Sauer, Hans; and Spahrbier, Dieter, to Varta Batterie Aktiengesellschaft. Air/zinc flat cell. 4,115,626, Cl. 429-27.000.
Saunders, James Warren, to Paccar Inc. Dash console access enabling tilting steering column. 4,114,719, Cl. 180-90.000.
Saupe, Martin: *See—*
Hoffmeister, Jurgen; and Saupe, Martin, 4,114,946, Cl. 297-191.000.
Savvateev, Ivan Ivanovich: *See—*
Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich, 4,114,415, Cl. 72-214.000.
Sawafuji Denki Kabushiki Kaisha: *See—*
Usui, Kazuhisa; and Muto, Osamu, 4,114,746, Cl. 192-104.00R.
Sawaoka, Eiji: *See—*
Shimizu, Wataru; and Sawaoka, Eiji, 4,114,998, Cl. 355-3.0DR.
Saxton, Forest Jackson, to Ecodyne Corporation. Cooling tower fill assembly. 4,115,484, Cl. 261-111.000.
Saylor, B. Franklin, to Garrett Corporation, The. Pressure biased pneumatic thermostat. 4,114,808, Cl. 236-87.000.

Sazykin, Valentin Vasilievich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Sberze, Piero: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.

Sbrocca, Dino A., to United States of America, Navy. Castable binder for cast plastic-bonded explosives. 4,115,167, Cl. 149-19.500.

Scalia, Peter F. Dispenser and applicator apparatus for edge wrapping of stained glass chips and the like with foil. 4,115,180, Cl. 156-446.000.

Scannell, James Parnell; and Stempel, Arthur, to Hoffmann-La Roche Inc. L-2-amino-4-(2-aminoethoxy)-butanoic acid. 4,115,105, Cl. 71-113.000.

Scata, Umberto; Luciani, Luciano; and Barbe, Pier Camillo, to Montedison S.p.A. Catalysts and catalyst components for polymerizing olefins. 4,115,319, Cl. 252-429.00B.

Schacht, Erich: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,115,456, Cl. 260-613.00R.

Schaefer, Hans-Joachim. Convertible sports shoe. 4,114,295, Cl. 36-100.000.

Schaefer Marine Products: *See—*
Hall, Eric R. D., 4,114,551, Cl. 114-98.000.

Schaefer, Milton E.: *See—*
McGhee, Jerry R.; and Schaefer, Milton E., 4,114,605, Cl. 128-2.00F.

Schaefer, Roland: *See—*
Gross, Albert; and Schaefer, Roland, 4,115,346, Cl. 260-42.150.

Schambeck, Herbert, to Dyckerhoff & Widmann AG. Longitudinally displaceable connection for cantilevered beam-type structural parts. 4,114,219, Cl. 14-16.100.

Scheibner, Gerald Harry: *See—*
Alderfer, Richard Bernhard; and Scheibner, Gerald Harry, 4,115,048, Cl. 425-72.00R.

Scheidegger, Albert. Closure cap. 4,114,774, Cl. 215-250.000.

Scherbakov, Vsevolod Sergeevich: *See—*
Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Scherbakov, Vsevolod Sergeevich; and Gruzintsev, Igor Andreevich, 4,115,043, Cl. 417-559.000.

Scherenberg, Volker. Cord retractor for retracting cord of electrical appliances. 4,114,736, Cl. 191-12.400.

Schering Corporation: *See—*
Mayer, Joseph; and Sherlock, Margaret H., 4,115,395, Cl. 260-296.00N.

Scheurecker, Werner: *See—*
Loibl, Lorenz; and Scheurecker, Werner, 4,114,679, Cl. 164-426.000.

Schiek, Robert J. All purpose indexing device. 4,114,752, Cl. 198-491.000.

Schjelde, Ole Mikel; and Larsen, Ebbe, to Danfoss A/S. Resilient pressure tube. 4,115,039, Cl. 417-363.000.

Schladetsch, Hans Jakob; and Schroth, Gunther, to Hoechst Aktiengesellschaft. Process for the preparation of dihydroxyphenylazophenylazophenyl dyestuffs. 4,115,380, Cl. 260-186.000.

Schlage, Ernest L., to Schlage Lock Company. Augmented key and cylinder lock. 4,114,411, Cl. 70-421.000.

Schlage Lock Company: *See—*
Schlage, Ernest L., 4,114,411, Cl. 70-421.000.

Schlegel(UK) Limited: *See—*
Pullan, Ronald Ernest, 4,114,320, Cl. 49-491.000.

Schlenker, H. Oscar, to Safeguard Automotive Corporation. Safety sleeve. 4,114,400, Cl. 64-3.000.

Schmelzer Corporation: *See—*
LaVene, Leon F., 4,114,417, Cl. 72-379.000.

Schmid & Wezel: *See—*
Jansen-Herfeld, Rottger; and Elmer, Stefan, 4,114,270, Cl. 30-394.000.

Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, to Veb Jenapharm. Process of making D,L-lithium pantoate and resolving the racemic mixture into its optically active isomers. 4,115,443, Cl. 562-402.000.

Schmidt, William G., to Satellite Business Systems. Single channel per burst TDMA multiple transponder network. 4,115,661, Cl. 179-15.0BS.

Schmiedel, Robert C.: *See—*
Sleder, Richard L.; and Schmiedel, Robert C., 4,114,583, Cl. 123-148.0CC.

Schmitt, Frederick J.: *See—*
Decker, Bernard J.; and Schmitt, Frederick J., 4,114,766, Cl. 214-3.000.

Schmitt, Frederick Louis: *See—*
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., 4,115,431, Cl. 260-465.00F.

Schmitt, Kirk D., to Mobil Oil Corporation. Lubricants containing substituted triazoles as antiwear agents. 4,115,288, Cl. 252-50.000.

Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., to Armco Steel Corporation. Apparatus for continuously contact-coating one side only of a ferrous base metal strip with molten coating metal. 4,114,563, Cl. 118-63.000.

Schneider, Bernhard Hank, to Steel Heddle Manufacturing Company. Bobbin. 4,114,828, Cl. 242-118.300.

Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, to L. Schuler GmbH. Dividing means control device. 4,114,489, Cl. 83-298.000.

Schneider, Georg. Feeding mechanism. 4,114,791, Cl. 226-91.000.

Schneider, Gottfried; Wagner, Kuno; and Patzelt, Heinz Wolfgang, to Bayer Aktiengesellschaft. Process for splitting up polyurethane waste into activated polyhydroxyl compounds. 4,115,298, Cl. 260-2.300.

Schneider, Stephen E.: *See—*
Mahoney, Robert D.; and Schneider, Stephen E., 4,115,492, Cl. 264-49.000.

Schneider, Walter. Bathroom cabinet. 4,114,966, Cl. 312-245.000.

Schneider, Wolfgang: *See—*
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,115,443, Cl. 562-402.000.

Schockmel, Robert: *See—*
Metz, Paul; Schockmel, Robert; Nick, Desire; and Pfeiffer, Paul, 4,115,089, Cl. 65-19.000.

Schoenholz, Daniel; and Perl, Martin M., to Du Pont de Nemours, E. I., and Company. Denture cleanser. 4,115,293, Cl. 252-102.000.

Schold, George R. Apparatus for dispersing finely divided solid particles in a liquid vehicle. 4,114,816, Cl. 241-46.110.

Scholer, Fred R.: *See—*
Blumbergs, John H.; and Scholer, Fred R., 4,115,059, Cl. 8-111.000.

Schollmeier, Gero: *See—*
Boese, Gunter; Neudorfer, Ernst; and Schollmeier, Gero, 4,115,687, Cl. 235-92.0DM.

Schroeder, Robert Frederich, to Mattel, Inc. Single flow direction miniature pump. 4,115,042, Cl. 417-479.000.

Schroeder, Walter W.; Sears, Noel C.; and Boni, Joseph C., to Sprague Electric Company. Method for forming a metal termination on a wound capacitor section. 4,115,600, Cl. 427-79.000.

Schroter, Herbert: *See—*
Frei, Jorg; Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,115,575, Cl. 424-250.000.

Schroth, Gunther: *See—*
Schladetsch, Hans Jakob; and Schroth, Gunther, 4,115,380, Cl. 260-186.000.

Schubert, Klaus-Peter; Keller, Hartmut; and Hildebrandt, Juergen J., to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Artificial hand and drive apparatus for such hand. 4,114,464, Cl. 74-89.140.

Schulte-Elte, Karl-Heinrich: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,114,630, Cl. 131-17.00R.

Schulte, Theodore B. Silage door guide. 4,114,748, Cl. 193-33.000.

Schulze, Ernst: *See—*
Hoehn, Hans; and Schulze, Ernst, 4,115,394, Cl. 260-296.00H.

Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corp. Polyether urea epoxy additives. 4,115,360, Cl. 528-94.000.

Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corp. Polyether urea epoxy additives. 4,115,361, Cl. 260-47.0EN.

Schulze, Heinz, to Texaco Development Corp. Polyether polyureides. 4,115,446, Cl. 260-553.00R.

Schumann, Burkhard: *See—*
Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, 4,114,489, Cl. 83-298.000.

Schurter, Rolf; Rempfler, Hermann; and Fory, Werner, to Ciba-Geigy Corporation. Selective herbicidal composition containing 2-pyridinol compounds. 4,115,100, Cl. 71-94.000.

Schwadtke, Karl: *See—*
Weber, Rudolf; Pochandke, Winfried; and Schwadtke, Karl, 4,114,284, Cl. 34-12.000.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 3-Methyl-4-phenyl-1,2,3,4-tetrahydrobenz [H]isoquinoline hydrobromide. 4,115,387, Cl. 260-286.00R.

Schwartz, Jacob; and Misek, Victor A., to Sanders Associates, Inc. Method and apparatus for increasing heat transfer efficiency. 4,114,685, Cl. 165-96.000.

Schweitzer, Karl: *See—*
Kudlich, Hans; and Schweitzer, Karl, 4,114,534, Cl. 101-115.000.

Schwendt, Lutz, to Thyssen Industrie Aktiengesellschaft. Stabilized turret. 4,114,512, Cl. 89-36.00K.

Schwenninger, Ernest N.; and Schwenninger, Ronald L., to PPG Industries, Inc. Measuring glass surface temperature during annealing. 4,114,444, Cl. 73-359.00R.

Schwenninger, Ronald L.: *See—*
Schwenninger, Ernest N.; and Schwenninger, Ronald L., 4,114,444, Cl. 73-359.00R.

Schwerdtel, Wulf: *See—*
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,115,462, Cl. 260-667.000.

Schwerdtfeger, Lee; Stillman, Lee E.; and Frain, William E., to United States of America, Air Force. Deployable ground plane antenna. 4,115,784, Cl. 343-915.000.

Scire, Joseph S. Lock assembly for bicycle wheel quick release mechanism. 4,114,409, Cl. 70-225.000.

SCM Corporation: *See—*
Close, Ralph E.; and Oroshnik, William, 4,115,466, Cl. 260-678.000.

Scott & Fetzer Company, The: *See—*
MacFarland, Charles H., 4,114,230, Cl. 15-330.000.

Scott, Howard L., to Widner College. Coating the hair with a heat-settable composition. 4,115,549, Cl. 424-71.000.

Scott, Ray A.: *See*—
Holladay, Jimmie L.; and Scott, Ray A., 4,114,672, Cl. 157-1.240.

Sears, Noel C.: *See*—
Schroeder, Walter W.; Sears, Noel C.; and Boni, Joseph C., 4,115,600, Cl. 427-79.000.

Sedlacek, Bruce; and Stevens, Gus, Jr. Cigarette rolling paper with integral pouch. 4,114,629, Cl. 131-15.00R.

Segawa, Sunichi: *See*—
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.

Seib, Karl: *See*—
Oppenlaender, Knut; Seib, Karl; and Krapf, Heinz, 4,115,314, Cl. 252-309.000.

Seipp, Emil: *See*—
Jager, Hans; and Seipp, Emil, 4,115,164, Cl. 148-175.000.

Sekiguchi, Yoji, to Katsura Machine Co., Ltd. Feeding device of a concrete block splitting apparatus. 4,114,773, Cl. 214-623.000.

Sekiya, Makoto: *See*—
Kinoshita, Hirotugu; Sekiya, Makoto; and Makino, Nobuo, 4,115,284, Cl. 252-29.000.

Sellars, Robert L.: *See*—
Porubcan, Randolph S.; and Sellars, Robert L., 4,115,199, Cl. 195-96.000.

Selvin, Gerald Joseph; Oliver, Leland Wayne; Yamamoto, Stephen Kazuo; and Hogan, Clarence Vaughn, to International Telephone and Telegraph Corporation. Electrical connector assembly. 4,114,976, Cl. 339-217.00S.

Selwood, Peter Richard, deceased; by Selwood, Timothy John, executor; by Axtell, Martin John Shelley, executor; and Burton, John David, to William R. Selwood Limited. Pumps. 4,115,041, Cl. 417-440.000.

Selwood, Timothy John, executor: *See*—
Selwood, Peter Richard, deceased; Selwood, Timothy John, executor; Axtell, Martin John Shelley, executor; and Burton, John David, 4,115,041, Cl. 417-440.000.

Seno, Hiroshi: *See*—
Sakabe, Yukio; and Seno, Hiroshi, 4,115,493, Cl. 264-61.000.

Sentinella, Victor Edward. Fire escape devices. 4,114,726, Cl. 182-5.000.

Sepelak, George R., to United States of America, Energy. Nuclear reactor pressure vessel support system. 4,115,193, Cl. 176-87.000.

Sequeira, Avilino; Pitman, Herbert J.; Harrison, Charles W.; and Quasny, Jerry E., to Texaco Inc. Solvent dewaxing process. 4,115,242, Cl. 208-33.000.

Sequeira, Avilino: *See*—
Harrison, Charles W.; Pitman, Herbert J.; and Sequeira, Avilino, 4,115,243, Cl. 208-33.000.
Pitman, Herbert J.; Harrison, Charles W.; and Sequeira, Avilino, 4,115,244, Cl. 208-33.000.

Serediuk, Vladislaus. Hairbrush. 4,114,222, Cl. 15-186.000.

Sery, Stanislav Vasilievich: *See*—
Mukhamedyarov, Rashid Mustafievich; Smirnov, Boris Andreevich; Sery, Stanislav Vasilievich; Titkova, Tatyana Dmitrievna; and Lokalov, Anatoly Ivanovich, 4,115,272, Cl. 210-266.000.

Sexton, James H.: *See*—
Patton, Bobbie J.; Sexton, James H.; Gravley, Wilton; and Foster, C. Mackay, Jr., 4,114,435, Cl. 73-151.500.

Seylar, George R., to Johns Hopkins University, The. Monitoring apparatus for resonant circuit intracranial pressure implants. 4,114,606, Cl. 128-2.05E.

Shafiee, Ali; Lalezari, Iraj; and Yassa, Narges, to Ministry of Science & Higher Education, The. Process for the production of thebaine. 4,114,314, Cl. 47-85.000.

Shajenko, Peter, to United States of America, Navy. Fiber optic acoustic array. 4,115,753, Cl. 340-6.00R.

Shambhu, Manvendra B.: *See*—
Digenis, George A.; Shambhu, Manvendra B.; and Theodorakis, Michael C., 4,115,540, Cl. 424-1.000.

Shanley, James J., personal representative: *See*—
Pico, Francisco Antonio, deceased; and Shanley, James J., personal representative, 4,115,507, Cl. 264-267.000.

Shapiro, Haskell: *See*—
Thiele, Carl L.; and Shapiro, Haskell, 4,115,007, Cl. 356-155.000.

Shapiro, Milton R.: *See*—
Clark, Kendall; and Shapiro, Milton R., 4,115,683, Cl. 219-121.00L.

Sharon, Shaul. Combination industrial razor blade dispenser and used blade receiver. 4,114,780, Cl. 221-101.000.

Sharova, Valentina Petrovna: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Sharp Kabushiki Kaisha: *See*—
Fujimoto, Isao; Aiba, Masahiko; Yamamoto, Yoichi; and Makita, Tomoo, 4,115,787, Cl. 346-75.000.
Fujimoto, Takeo; Torimaru, Yasuo; Ogawa, Shin-ichi; and Yasue, Shinya, 4,115,796, Cl. 357-42.000.
Mitarai, Akira; and Fujiwara, Sigekazu, 4,115,738, Cl. 329-105.000.
Nakamura, Tutomu; Shigemasa, Junichiro; and Tani, Zenpei, 4,115,832, Cl. 361-256.000.
Okada, Yoshimasa, 4,115,821, Cl. 360-72.000.
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.

Sharpe, Charles William Scott, to Perenco Limited. Relating to pressure fluid operated actuators. 4,114,470, Cl. 74-441.000.

Shaw, Michael J., to Allied Paper Incorporated. Process for producing lithographic printing plates having a paper base. 4,115,603, Cl. 427-326.000.

Shaw, Robert F.; and Sperinde, John M. Catheter oximeter apparatus and method. 4,114,604, Cl. 128-2.00L.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Catalyst compositions especially useful for preparation of unsaturated acids. 4,115,441, Cl. 562-534.000.

Shaw, William C., to Imax Entertainment Limited. Inlet guide structure for rolling loop film transport mechanism. 4,114,996, Cl. 352-184.000.

Shelby, Thomas A.; and Gallien, Shelby W., to Rea Magnet Wire Co., Inc. Wire enamel with low soldering temperature. 4,115,342, Cl. 260-33.40P.

Shell, John W., to Alza Corporation. Ocular system made of bioerodible esters having linear ether. 4,115,544, Cl. 424-14.000.

Shell Oil Company: *See*—
Van Steveninck, Johannes; and Lincklaen Arriens, Jan, 4,114,390, Cl. 405-163.000.

Shellhause, Ronald L., to General Motors Corporation. Master cylinder assembly. 4,114,377, Cl. 60-589.000.

Sheludko, Valentin Vasilievich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Sheng, Ming Nan; and Kao, Jar-lin, to Atlantic Richfield Company. Selenium catalyzed decomposition of peroxide intermediates resulting from the autoxidation of acrolein and methacrolein. 4,115,440, Cl. 562-533.000.

Shepard, Leonard F.: *See*—
Spanel, Abram N.; and Shepard, Leonard F., 4,115,659, Cl. 179-1.0HF.

Shepherd, Alexander Turnbull, to Ferranti Limited. Displacement measuring apparatus. 4,115,008, Cl. 356-172.000.

Shepherd, John P. G.: *See*—
Cowman, Charles D., Jr.; and Shepherd, John P. G., 4,115,486, Cl. 264-1.000.

Sherlock, Margaret H.: *See*—
Mayer, Joseph; and Sherlock, Margaret H., 4,115,395, Cl. 260-296.00N.

Sherman, William: *See*—
Jones, Alan P.; and Sherman, William, 4,114,804, Cl. 235-476.000.

Shibahara, Yasuo: *See*—
Tominaga, Yoichi; and Shibahara, Yasuo, 4,115,331, Cl. 260-17.4CL.

Shibano, Takashi: *See*—
Yamashita, Kazuo; Yokose. Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,115,476, Cl. 260-880.00R.

Shichi, Shigeharu: *See*—
Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, 4,114,548, Cl. 112-258.000.

Shichman, Daniel: *See*—
Baboff, Leon Ian; Shichman, Daniel; and Reed, Lawrence Paul, 4,115,172, Cl. 156-115.000.

Shigemasa, Junichiro: *See*—
Nakamura, Tutomu; Shigemasa, Junichiro; and Tani, Zenpei, 4,115,832, Cl. 361-256.000.

Shigeta, Yasuo, to Sony Corporation. System for the editing of a magnetic tape in one VTR with a portion of a signal reproduced from a tape on another VTR. 4,115,819, Cl. 360-14.000.

Shima, Yoshiharu, to Nissei Plastics Industrial Co., Ltd. Method for producing injection molded ski. 4,115,506, Cl. 264-250.000.

Shimada, Hideyuki: *See*—
Wada, Mitsuyoshi; Shimada, Hideyuki; and Ohta, Koji, 4,115,023, Cl. 404-98.000.

Shimizu, Junichi; and Hashizume, Kyosuke, to Mitsui Sugar Co., Ltd. Process for producing nutritive sugar from cane juice. 4,115,147, Cl. 127-54.000.

Shimizu, Noboru: *See*—
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.

Shimizu, Wataru; and Sawaoka, Eiji, to Tokyo Shibaura Electric Co., Ltd. Copying machine with removable photosensitive drum. 4,114,998, Cl. 355-3.0DR.

Shin-Etsu Chemical Co., Ltd.: *See—*
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.
Hiiro, Takeshi; Sakurai, Hideki; and Kondo, Fumihiko, 4,115,426, Cl. 260-448.20E.
Noshiro, Atsumi; and Inoue, Yoshio, 4,115,329, Cl. 260-25.000.

Shin Nihon Koku Seibi K.K.: *See—*
Umeda, Katsuhiko, 4,114,232, Cl. 16-35.00R.

Shinozaki, Tokujiro, to Japan Crown Cork Co., Ltd. Cap with sealing liner. 4,114,775, Cl. 215-324.000.

Shiozaki, Shigeru: *See—*
Mitsuishi, Yukio; Shiozaki, Shigeru; and Hasegawa, Kinji, 4,115,617, Cl. 428-336.000.

Shirai, Tadashi: *See—*
Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, 4,115,439, Cl. 562-402.000.

Shiroma, Dallas M.: *See—*
Hannemann, Dennis M.; Huang, Kwang Ta; and Shiroma, Dallas M., 4,115,704, Cl. 307-64.000.

Shivak, Robert A.; and Johnston, David J., to Sno-Trik Company. High pressure valve. 4,114,851, Cl. 251-88.000.

Shroff, Shrenik: *See—*
Vassiliades, Anthony E.; Vincent, David N.; and Shroff, Shrenik, 4,115,474, Cl. 260-855.000.

Shuffman, Oscar, deceased: *See—*
Ross, Sigmund Lance; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, 4,114,552, Cl. 114-227.000.

Shuffman, Rose, executrix: *See—*
Ross, Sigmund Lance; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, 4,114,552, Cl. 114-227.000.

Shulman, Joseph: *See—*
MacLeish, William T.; and Shulman, Joseph, 4,115,618, Cl. 428-204.000.

Shulman, Lawrence M.; and Weingart, Norman, to Systems Consultants, Inc. Electronic recording accelerometer. 4,114,450, Cl. 73-489.000.

Shuster, Edward J.: *See—*
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., 4,115,431, Cl. 260-465.00F.

Sibley, Clarence E.; and Sablan, Francisco C. Aerial photography camera mount assembly. 4,114,839, Cl. 244-118.00R.

Sieffert, William G., to Champion International Corporation. Book carton. 4,114,757, Cl. 206-424.000.

Siegfried Aktiengesellschaft: *See—*
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,115,393, Cl. 260-295.50R.

Siegl, Walter O., to Ford Motor Company. Metal chelating ligands. 4,115,397, Cl. 260-296.00T.

Siegler, Gustav; and Jahn, Eberhard. Sleeve plug for attachment to a spindle head. 4,115,018, Cl. 408-239.00A.

Siemens Aktiengesellschaft: *See—*
Boese, Gunter; Neudorfer, Ernst; and Schollmeier, Gero, 4,115,687, Cl. 235-92.0DM.
Pawlik, Dieter; and Zschauer, Karl-Heinz, 4,115,162, Cl. 148-171.000.
Platzoeder, Karl, 4,115,798, Cl. 357-64.000.

Sighieri, Pierluigi; and Colleoni, Gianfranco, to UTITA S.p.A. Officine e Fonderie di Este. Device for capturing and removing textile yarns, by suction and pneumatic entraining. 4,114,790, Cl. 226-91.000.

Sih, Charles John: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,115,453, Cl. 260-586.00G.

Silberberg, Jeffrey L., to United States of America, Health, Education and Welfare. Digital display plug-in. 4,115,733, Cl. 324-99.00D.

Silva, Luigi: *See—*
Maiocchi, Luigi; and Silva, Luigi, 4,114,671, Cl. 152-209.00R.

Simiand, Jacques: *See—*
Nanthavong, Souli; Pigerol, Charles; Eymard, Pierre; and Simiand, Jacques, 4,115,401, Cl. 260-326.430.

Simmons, Carl E., to United Aircraft Products, Inc. Integrated refrigerant storage canister and heat exchanger. 4,114,395, Cl. 62-386.000.

Simon, Albert Pavlovich: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Simon-Hartley Limited: *See—*
Toft, Kenneth Herman, 4,115,279, Cl. 210-521.000.

Simonsen, Roger H.: *See—*
Houston, George B.; and Simonsen, Roger H., 4,115,850, Cl. 364-200.000.

Simpson, Glen David: *See—*
Lewyn, Lanny Louis; and Simpson, Glen David, 4,114,627, Cl. 128-419.0PT.

Sinclair, Albert Richard: *See—*
Maurer, William Casper; Sinclair, Albert Richard; and McDonald, William Jesse, Jr., 4,114,704, Cl. 175-107.000.

Sindlinger, Norman E.: *See—*
Guerrero, Benjamin G.; Leistikow, Gerard K.; and Sindlinger, Norman E., 4,114,313, Cl. 46-264.000.

Singer Company, The: *See—*
Mindell, Marvin I., 4,115,824, Cl. 360-80.000.

Sink, William H.; and Mitchener, Russel L., to Dana Corporation. Fluid actuated operator and clutch linkage. 4,114,743, Cl. 192-91.00R.

Sire, Efim Moiseevich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Skagit Corporation: *See—*
Pavlecka, Vladimir H.; and McIntyre, David G., 4,114,837, Cl. 244-26.000.

Skaletz, Detlev Herbert, to Hoechst Aktiengesellschaft. Process for the electrochemical dihydrogenation of naphthyl ethers. 4,115,216, Cl. 204-73.00R.

Skalla, Dale W.: *See—*
Alsberg, Henry; Skalla, Dale W.; and Tirpak, Michael R., 4,115,478, Cl. 260-880.00R.

SKF Compagnie d'Applications Mecaniques: *See—*
Colonna, Jerome; Monville, Jean-Michel; and Munoz, Francois, 4,114,739, Cl. 192-41.00A.

Skidmore, Lawrence M., to Armour and Company. Method and machine for slicing materials. 4,114,492, Cl. 83-367.000.

Skirde, Gerhard: *See—*
Bachhofer, Bruno; Locher, Anton; Skirde, Gerhard; and Quistorff, Hansjorg, 4,115,267, Cl. 210-136.000.

Skoglund, Liv: *See—*
Halmo, Terje Martin; and Skoglund, Liv, 4,115,497, Cl. 264-115.000.

Skorianetz, Werner: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,114,630, Cl. 131-17.00R.

Skrovanek, Ambroz K.; and Clark, Fred E., Jr., to Harvey Hubbell Incorporated. Echo suppressor with SF transmission and regeneration. 4,115,668, Cl. 179-170.200.

Skutta, Frank Robert, to Motorola, Inc. Fast attack automatic gain control circuit. 4,115,741, Cl. 330-284.000.

Sleder, Richard L.; and Schmiedel, Robert C., to Brunswick Corporation. Triggered ignition system for internal combustion engines with anti-reverserunning control. 4,114,583, Cl. 123-148.0CC.

Slinkard, William E., to Celanese Corporation. Oxidation of butene. 4,115,442, Cl. 562-548.000.

Sloan Valve Company: *See—*
Billeter, Henry R., 4,115,026, Cl. 408-10.000.

Smashey, Russell W.; Frey, Elmer L.; Cash, George V.; and Irons, George S., to General Electric Company. Cobalt-base alloy and article. 4,115,112, Cl. 75-171.000.

Smetanjuk, Vladimir Ivanovich: *See—*
Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Nametkin, Nikolai Sergeevich; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,468, Cl. 260-683.15D.
Bocharov, Jury Nikolaevich; Antonov, Andrei Alexandrovich; Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,115,469, Cl. 260-683.15D.

Smirnov, Boris Andreevich: *See—*
Mukhamedyarov, Rashid Mustafievich; Smirnov, Boris Andreevich; Sery, Stanislav Vasilievich; Titkova, Tatyana Dmitrievna; and Lokalov, Anatoly Ivanovich, 4,115,272, Cl. 210-266.000.

Smirnov, Vladislav Petrovich: *See—*
Kogan, Lev Moiseevich; Monastyrskaya, Natalya Borisovna; Davydova, Larisa Mikhailovna; Kropacheva, Elena Nikolaevna; Belgorodsky, Izrail Markovich; Belgorodskaya, Olga Izrailevna; Bolkhovets, Basia Moiseevna; Gagin, Anatoly Vasilievich; Garmonov, Izmail Vladimirovich; Kovalev, Nikolai Fedorovich; Krol, Vladimir Alexandrovich; Lukashov, Anatoly Ivanovich; Sazykin, Valentin Vasilievich; Smirnov, Vladislav Petrovich; Estrin, Arkady Samuilovich; Lvov, Jury Alexandrovich; Sire, Efim Moiseevich; Pospelova, Lidia Mikhailovna; Bataeva, Ljubov Petrovna; Kavun, Semen Moiseevich; and Lykin, Anatoly Sergeevich, 4,115,636, Cl. 526-47.600.

Smith, Daniel Wm. Work aligning vise jaw. 4,114,868, Cl. 269-136.000.

Smith, Franklin E., to Cutler-Hammer, Inc. Current commutation means for illuminated switch indicator. 4,115,673, Cl. 200-315.000.

Smith, Gardner M. Interchangeable sandal. 4,114,296, Cl. 36-101.000.

Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Semiconductor apparatus for analog to digital conversion. 4,115,766, Cl. 340-347.0AD.

Smith, Harry A., to Dow Chemical Company, The. Process for preparing aminomethyl diaryl compound resins. 4,115,365, Cl. 528-132.000.

Smith, Herman W., to Upjohn Company, The. cis-4,5-Didehydro-13,14-

didehydro-11-deoxy-17-phenyl-18,19,20-trinor-$PGF_{1\alpha}$compounds. 4,115,651, Cl. 560-55.000.

Smith International, Inc.: *See*—
Webb, Daniel R.; Steinke, John R.; Berry, Robert W.; and Funsten, Stanard R., 4,114,698, Cl. 173-1.000.

Smith, John A.: *See*—
Snavely, Cloyd A.; and Smith, John A., 4,115,106, Cl. 75-0.5AA.

Smith, Kenneth Cecil; and Garrett, Michael Ernest. Treatment of sewage. 4,115,258, Cl. 210-15.000.

Smith, Leslie Harold: *See*—
Large, Michael Stewart; and Smith, Leslie Harold, 4,115,409, Cl. 260-347.300.

Smith, Linda Hebert; and Johnson, Robert C., to Buckeye Cellulose Corporation, The. Liquid impervious cuff for a disposable surgical gown and method of attachment of the cuff thereto. 4,114,200, Cl. 2-51.000.

Smith, Roland L. Vehicle-actuated air compressor and system therefor. 4,115,034, Cl. 417-231.000.

Smith, Stanley E., to Raymond Lee Organization, Inc., The, a part interest. Match up game. 4,114,292, Cl. 35-9.00B.

Smith, Thomas W.; and Bibbee, Jeffrey N., to McNeil Corporation. Probe injection system for a tire curing process. 4,115,046, Cl. 425-29.000.

Smith & Wesson Chemical Company, Inc.: *See*—
Litman, Alan, 4,114,302, Cl. 42-1.0ST.

Smith, William E.; and Nelson, Roy G., to United Technologies Corporation. Method of making resiliently coated metallic finger seals. 4,114,248, Cl. 29-460.000.

SmithKline Corporation: *See*—
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,115,642, Cl. 536-121.000.

Smolyanitsky, Boris Nikolaevich: *See*—
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich, 4,114,700, Cl. 175-19.000.

Smura, B. Bernard, to Allied Chemical Corporation. Cell connector for bipolar electrolyzer. 4,115,236, Cl. 204-254.000.

Snap-Tite, Inc.: *See*—
Maier, Albin, 4,114,827, Cl. 242-86.510.

Snavely, Cloyd A.; and Smith, John A., to National Standard Company. Method for producing metallic oxide compounds. 4,115,106, Cl. 75-0.5AA.

Snavely, Earl S., Jr.: *See*—
Foster, William R.; and Snavely, Earl S., Jr., 4,114,693, Cl. 166-305.00R.

Snella, Henry John: *See*—
Higgins, Thomas Engel; Ross, Camilla Brems; and Snella, Henry John, 4,115,594, Cl. 426-140.000.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Corrado, Giovanni, 4,115,370, Cl. 260-22.0CQ.

Sno-Trik Company: *See*—
Shivak, Robert A.; and Johnston, David J., 4,114,851, Cl. 251-88.000.

Snow, Robert Eric, to JFD Electronics Corporation. Electronic solid state FM dipole antenna. 4,115,778, Cl. 343-701.000.

Snyder, J. Gerald. Method and apparatus for adjusting the resilience of a hollow ball having an internal pressure. 4,114,350, Cl. 53-79.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Giacoppo, Guglielmo; and Tres, Ercole, 4,115,665, Cl. 179-98.000.
Laface, Carmelo; and Vantellini, Carlo, 4,115,664, Cl. 179-84.00R.

Societe Anonyme Automobiles Citroen: *See*—
Estaque, Andre, 4,114,480, Cl. 74-865.000.

Societe Anonyme pour l'Etude et la Promotion des Entreprises: *See*—
Vincens, Rene, 4,114,341, Cl. 52-580.000.

Societe Anonyme Roure Bertrand Dupont: *See*—
Plattier, Marcel; and Teisseire, Paul Jose, 4,115,326, Cl. 252-522.000.

Societe B.V.S.: *See*—
Milan, Daniel, 4,114,705, Cl. 175-340.000.

Societe d'Assistance Technique pour Produits Nestle, S.A.: *See*—
Hauser, Ivo, 4,114,434, Cl. 73-150.00R.

Societe de Vente de l'Aluminium Pechiney: *See*—
Patrie, Jos; and Colombier, Gabriel, 4,115,212, Cl. 204-38.00E.

Societe des Plastiques de Carmaux Scasar: *See*—
Pied, Jean-Philippe, 4,115,347, Cl. 260-42.460.

Societe Europeenne de Propulsion: *See*—
Habermann, Helmut; Brunet, Maurice; and LeClere, Jacques, 4,114,960, Cl. 308-10.000.

Societe Telegraphiques et Telephoniques: *See*—
Ernyei, Herbert; and Langlois, Etienne, 4,114,454, Cl. 73-579.000.

Soder, Alfons: *See*—
Weber, Rolf-Ortwin; Soder, Alfons; and Boksay, Istvan, 4,115,569, Cl. 424-250.000.

Soderberg, John Lennart: *See*—
Rothman, Ulf Sven Erik; Kagedal, Sven Lennart; and Soderberg, John Lennart, 4,115,536, Cl. 424-1.000.

Soeno, Ko; Doi, Toshio; Iizuka, Tomio; Sakamoto, Hiroshi; Ando, Hisashi; Oyama, Tetsuo; and Misumi, Akira, to Hitachi, Ltd. Process for producing cathode for cathode ray tube of directly heating type. 4,114,243, Cl. 29-25.140.

Sohma, Yukio: *See*—
Nagano, Genzo; Nakamura, Hiroshi; and Sohma, Yukio, 4,115,851, Cl. 364-200.000.

Solation Products, Inc.: *See*—
Newton, Alwin B., 4,114,600, Cl. 126-271.000.

Sonneborn, Walter G. O.: *See*—
Drees, Jan M.; Sonneborn, Walter G. O.; and Yen, Jing G., 4,115,031, Cl. 416-134.00A.

Sony Corporation: *See*—
Aoki, Teruaki; and Abe, Motoaki, 4,114,254, Cl. 29-571.000.
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,115,737, Cl. 325-459.000.
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.
Miyaoka, Senri, 4,115,808, Cl. 358-127.000.
Morio, Minoru; and Kambara, Masahiro, 4,115,820, Cl. 360-33.000.
Ogisu, Kenji; and Enomoto, Masahisa, 4,115,213, Cl. 204-39.000.
Sakamoto, Hitoshi, 4,115,800, Cl. 358-8.000.
Shigeta, Yasuo, 4,115,819, Cl. 360-14.000.
Yoshida, Tadao; and Suzuki, Tadao, 4,115,740, Cl. 330-264.000.

Soran, Robert L., to Pet Foods. Apparatus for denaturing food products not intended for human consumption. 4,114,526, Cl. 99-533.000.

Sosenko, Lev Matveevich: *See*—
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Sotec Corporation: *See*—
Reitz, Norman E., 4,115,625, Cl. 428-641.000.

Souchay, Philippe: *See*—
Beauvais, Thierry; and Souchay, Philippe, 4,115,865, Cl. 364-604.000.

Southern, Raymond L.; and Bishop, Harry L., to Allegheny Ludlum Industries, Inc. Process for producing elongated metal articles. 4,114,251, Cl. 29-527.700.

Spahrbier, Dieter: *See*—
Sauer, Hans; and Spahrbier, Dieter, 4,115,626, Cl. 429-27.000.

Spainhour, Phillip A.; Hampton, Robert S., Jr.; and Morrison, Leonard A., to Ammco Tools, Inc. Caster camber gauge. 4,114,283, Cl. 33-337.000.

Spanel, Abram N.; and Shepard, Leonard F., to Spanel, Abram N. Electroacoustical telephone adapter. 4,115,659, Cl. 179-1.0HF.

Spater, Stuart S., to Nichols Engineering & Research Corporation. Method and apparatus for regenerating and manufacturing activated carbon. 4,115,317, Cl. 252-418.000.

Speaight, David Clement, to Wellworthy Limited. Pistons. 4,114,519, Cl. 92-221.000.

Speca, Anthony N., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,115,318, Cl. 252-428.000.

Specht, Steven J.: *See*—
Woodard, Kenneth E., Jr.; and Specht, Steven J., 4,115,237, Cl. 204-258.000.

Speich, Peter: *See*—
Lorenz, Kurt; Dungs, Horst; Speich, Peter; and Kurtz, Roman, 4,115,202, Cl. 202-99.000.

Spencer, David R.; and Archer, Wesley L., to Dow Chemical Company, The. Stabilized 1,1,1-trichloroethane composition. 4,115,461, Cl. 260-652.50R.

Speno International S.A.: *See*—
Panetti, Romolo, 4,115,857, Cl. 364-474.000.

Sperinde, John M.: *See*—
Shaw, Robert F.; and Sperinde, John M., 4,114,604, Cl. 128-2.00L.

Sperry Rand Corporation: *See*—
Brown, Richard R., 4,115,863, Cl. 364-521.000.
Hofferber, Henry E.; and Parker, Robert H., 4,114,842, Cl. 244-180.000.
Osder, Stephen S.; and Mossman, David C., 4,115,847, Cl. 364-101.000.
Roeder, Robert S.; and Bomar, Lucien C., II, 4,115,776, Cl. 343-100.0ME.

Spetsialnoe Konstruktorskoe Bjuro "Transnefteavtomatika": *See*—
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Spilhaug, Tor William: *See*—
Brynemo, Jan Jorgen; and Spilhaug, Tor William, 4,114,940, Cl. 294-82.00R.

Spin Physics, Inc.: *See*—
Dorreboom, Jelmer, 4,114,259, Cl. 29-603.000.

Sprague Electric Company: *See*—
Schroeder, Walter W.; Sears, Noel C.; and Boni, Joseph C., 4,115,600, Cl. 427-79.000.

Sprecker, Mark A.: *See*—
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., 4,115,431, Cl. 260-465.00F.

Spring Chemicals Limited: *See*—
Stark, William H.; and Chu, Cheng-Hsien, 4,115,517, Cl. 423-243.000.

Spry, Douglas O.: *See—*
Kukolja, Stjepan; and Spry, Douglas O., 4,115,643, Cl. 544-16.000.
Spurmach Espana S. L.: *See—*
Creus, Rufino, 4,114,359, Cl. 57-124.000.
Stadhouders, Jacobus J.: *See—*
Driessen, Frans M.; Ubbels, Jacob; and Stadhouders, Jacobus J., 4,114,525, Cl. 99-465.000.
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Stabilized red phosphorus and process for making it. 4,115,522, Cl. 423-322.000.
Stamicarbon, B.V.: *See—*
Verstegen, Johannes D. M., 4,115,208, Cl. 203-81.000.
Stamvik, Anders Robert: *See—*
Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,115,414, Cl. 260-397.500.
Stanbridge, David W.: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,115,075, Cl. 48-197.00R.
Standard Oil Company, The: *See—*
Bartek, Joseph P.; Dolhyj, Serge R.; Velenyi, Louis J.; and Grasselli, Robert K., 4,115,464, Cl. 260-668.00C.
Shaw, Wilfrid G.; and Terrill, David B., 4,115,441, Cl. 562-534.000.
Standard Pressed Steel Co.: *See—*
Clark, Leonard R.; and Meehl, David W., 4,114,249, Cl. 29-513.000.
Stanford, Melvin E., to Faultfinders, Inc. Test fixture employing plural platens for advancing some or all of the probes of the test fixture. 4,115,735, Cl. 324-158.00F.
Stanley Works, The: *See—*
Cotton, Lawrence M., 4,114,664, Cl. 144-134.00D.
Hildebrandt, William J.; and Rathbun, Richard H., 4,114,268, Cl. 30-262.000.
Stanuszek, Dennis M., to Midland-Ross Corporation. Rod and piston connection for hydraulic devices. 4,114,378, Cl. 60-589.000.
Stapler, W. Mead. Turbine-type flow responsive device. 4,114,440, Cl. 73-231.00R.
Stark, William H.; and Chu, Cheng-Hsien, to Spring Chemicals Limited. Treatment of sulfur oxides with aqueous glyoxylic acid solutions. 4,115,517, Cl. 423-243.000.
Stark, William M.: *See—*
Hamill, Robert L.; Stark, William M.; and DeLong, Donald C., 4,115,552, Cl. 424-118.000.
Stauffer Chemical Company: *See—*
Arneklev, Duane R., 4,115,099, Cl. 71-93.000.
Davis, Gershon Jerry, 4,115,483, Cl. 260-980.000.
Fancher, Llewellyn W., 4,115,558, Cl. 424-205.000.
Lam, Hsiao Ling; and Teach, Eugene G., 4,115,556, Cl. 424-200.000.
Lam, Hsiao Ling; and Teach, Eugene G., 4,115,560, Cl. 424-211.000.
Lam, Hsiao-Ling; and Pallos, Ferenc M., 4,115,582, Cl. 424-298.000.
Mihailovski, Alexander, 4,115,581, Cl. 424-288.000.
Stauner, Thomas: *See—*
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,115,121, Cl. 96-56.300.
Steel Heddle Manufacturing Company: *See—*
Schneider, Bernhard Hank, 4,114,828, Cl. 242-118.300.
Steinberg, Julius M.: *See—*
Cone, Charles N.; and Steinberg, Julius M., 4,115,178, Cl. 156-291.000.
Steinke, John R.: *See—*
Webb, Daniel R.; Steinke, John R.; Berry, Robert W.; and Funsten, Stanard R., 4,114,698, Cl. 173-1.000.
Stelmack, Joseph J. Apparatus for quenching blown films. 4,115,047, Cl. 425-72.00R.
Stempel, Arthur: *See—*
Scannell, James Parnell; and Stempel, Arthur, 4,115,105, Cl. 71-113.000.
Steneras, Bo Sanfrid Emanuel: *See—*
Ericson, Hans Goran; and Steneras, Bo Sanfrid Emanuel, 4,114,720, Cl. 180-133.000.
Stenson, Stanley E. Fence staple. 4,114,859, Cl. 256-48.000.
Stephens, James W. Solar collector. 4,114,599, Cl. 126-271.000.
Sterling Drug Inc.: *See—*
John, Phillip Merrill, 4,115,563, Cl. 424-241.000.
Stevens, Gus, Jr.: *See—*
Sedlacek, Bruce; and Stevens, Gus, Jr., 4,114,629, Cl. 131-15.00R.
Stewart, William S., to Phillips Petroleum Company. Process control method and apparatus. 4,115,862, Cl. 364-500.000.
Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek: *See—*
Driessen, Frans M.; Ubbels, Jacob; and Stadhouders, Jacobus J., 4,114,525, Cl. 99-465.000.
Sticker, Robert Earl, to FMC Corporation. Dihydropyrazolone herbicide. 4,115,096, Cl. 71-92.000.
Stieber, Volker Adolf Wilhelm, to Applied Radiation Corporation. Monitoring system for high-voltage supply. 4,115,830, Cl. 361-187.000.
Stieringer, Albert; and Borner, Gerhard, to Robert Bosch GmbH. Digital display of photographic data. 4,114,995, Cl. 352-171.000.
Stiller, Paul Franklin. Power supply for transportable devices. 4,114,973, Cl. 339-92.00M.
Stillman, Lee E.: *See—*
Schwerdtfeger, Lee; Stillman, Lee E.; and Frain, William E., 4,115,784, Cl. 343-915.000.
Stockel, Joseph F.: *See—*
Van Ommering, Gerrit; Stockel, Joseph F.; and Dunlop, James D., 4,115,630, Cl. 429-72.000.
Stolka, Milan; Pai, Damodar M.; and Yanus, John F., to Xerox Corporation. Imaging member having a polycarbonate-biphenyl diamine charge transport layer. 4,115,116, Cl. 96-1.50R.
Stoll, Andrew Joseph, III, to Owens-Illinois, Inc. Bung hole assembly. 4,114,779, Cl. 220-288.000.
Stoltze, Leon; and Graff, John M., to United Technologies Corporation. Selectively bonded composite tape. 4,115,611, Cl. 428-174.000.
Stork Brabant B.V.: *See—*
Anselrode, Lodewijk, 4,115,234, Cl. 204-180.00R.
Storms, Ronald L., to Brunswick Corporation. Method of autogenously bonding filter assemblies. 4,114,794, Cl. 228-182.000.
Stowe, Alan Andrews. Towing apparatus. 4,114,919, Cl. 280-292.000.
Strader, M. Lane. Gutter cleaning device. 4,114,938, Cl. 294-19.00R.
Stratienko, Andrew, to Dresser Industries, Inc. Valve actuator. 4,114,469, Cl. 74-424.8VA.
Stratienko, Andrew, to Dresser Industries, Inc. Gear shaft assembly. 4,114,474, Cl. 74-625.000.
Straub, Erik K. Pile protection device. 4,114,388, Cl. 405-216.000.
Straumann, Fritz, to Institut Dr. Ing. Reinhard Straumann AG. Method of manufacturing a bearing part. 4,115,156, Cl. 148-12.70N.
Streckenbach, Bruce Lindsay: *See—*
Perkins, Donald Leroy; and Streckenbach, Bruce Lindsay, 4,114,930, Cl. 285-334.500.
Strelchenko, Vladimir Sergeevich: *See—*
Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich, 4,114,415, Cl. 72-214.000.
Stringer, Frederick David: *See—*
Dacey, Raymond B.; and Stringer, Frederick David, 4,114,756, Cl. 206-389.000.
Strnat, Karl: *See—*
Greinacher, Ekkehard; Reinhardt, Klaus; and Strnat, Karl, 4,115,159, Cl. 148-105.000.
Strubbe, Joseph, to U C B, Societe Anonyme. Process for inhibiting blood platelet aggregation. 4,115,579, Cl. 424-274.000.
Strugielski, Ronald T.; and Mulcahy, Harry William, to AMSTED Industries Incorporated. Railway truck bolster. 4,114,540, Cl. 105-226.000.
Studt, William Lyon: *See—*
Douglas, George Henry; Studt, William Lyon; and Dodson, Stuart Alan, 4,115,647, Cl. 544-63.000.
Stull Chemical Company: *See—*
Stull, Emerson B., 4,115,098, Cl. 71-93.000.
Stull, Emerson B., to Stull Chemical Company. Pest control composition and method. 4,115,098, Cl. 71-93.000.
Stumpp, Gerhard, to Robert Bosch GmbH. Fuel-air-mixtures controller for internal combustion engines. 4,114,579, Cl. 123-139.0AW.
Sturkey, William Cleere: *See—*
Turner, James Keith; and Sturkey, William Cleere, 4,114,407, Cl. 68-178.000.
Sturman, Oded E.; and Grill, Benjamin, to Burwell, Clifton J., a part interest. Fluid control system and controller and moisture sensor therefor. 4,114,647, Cl. 137-624.200.
Subramanian, Gopal; and McAfee, John Gilmore, to Research Corporation. Bone-seeking technetium-99m complex. 4,115,541, Cl. 424-1.500.
Suga, Shigeru. Three-dimensional atomizing spray tower. 4,114,813, Cl. 239-500.000.
Sugawara, Yasuyuki: *See—*
Ishida, Yukinori; Kojima, Moriaki; Kobayashi, Toshiaki; and Sugawara, Yasuyuki, 4,114,981, Cl. 350-96.330.
Sugimura, Yukio; Miyamoto, Norioki; Iwasaki, Tetsuji; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, to Kao Soap Co., Ltd. Germicidal herbicide for agriculture and horticulture. 4,115,103, Cl. 71-98.000.
Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, to Mitsubishi Gas Chemical Company, Inc. Process for continuous production of oxymethylene polymers. 4,115,369, Cl. 526-65.000.
Sugiura, Teruo; Tsubouchi, Hiromitsu; Ishida, Nobuyasu; and Kobayashi, Kiyonori, to Aisin Seiki Kabushiki Kaisha. Device for preventing vibration of a pressure plate of a friction clutch of a vehicle. 4,114,740, Cl. 192-70.180.
Suito, Senji: *See—*
Kasahara, Takahiko; Shichi, Shigeharu; Banno, Hideo; Suito, Senji; and Kato, Masayuki, 4,114,548, Cl. 112-258.000.
Sukolics, Ronald D., to Kawneer Company, Inc. Skylight system. 4,114,330, Cl. 52-200.000.
Suminsby, John Edward. "Strapdown" induction compass transmitter with compensation for heading errors due to the vertical component of the Earth's magnetic field and due to two cycle error during turns and during climbing and diving maneuvers. 4,114,436, Cl. 73-178.00R.
Sumitomo Chemical Company, Limited: *See—*
Matsuda, Yoshinobu; Suzuki, Yukio; and Yasui, Seimei, 4,115,437, Cl. 260-513.00R.
Okubo, Masao; Miki, Masayoshi; and Ueda, Takeshi, 4,115,148, Cl. 134-21.000.
Sumitomo Durez Company, Ltd.: *See—*
Kikuga, Toyoji; and Hirai, Koji, 4,115,327, Cl. 260-17.200.

Sumitomo, Yuji: *See—*
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.

Sump, Kenneth R., to United States of America, Energy. Nuclear waste storage container with metal matrix. 4,115,311, Cl. 252-301.10W.

Sundman, Frey Viking, to A. Ahlstrom Osakeyhtio. Process for bleaching cellulose pulp with molecular oxygen. 4,115,186, Cl. 162-65.000.

Superfile, Ltd.: *See—*
Menahem, Salomon, 4,114,963, Cl. 312-184.000.

Sussmuth, Reiner W., to Amtel, Inc. Spade drill blade. 4,115,024, Cl. 407-114.000.

Sutton, Blaine M.: *See—*
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,115,642, Cl. 536-121.000.

Sutton, Paul M.: *See—*
Bostick, Hoyt A.; Sutton, Paul M.; and Richards, Chester L., 4,114,978, Cl. 350-1.700.

Sutton, Richard C.: *See—*
Hamilton, Lewis R.; and Sutton, Richard C., 4,115,124, Cl. 96-82.000.

Suzuka, Teruo: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.

Suzuki, Etsuo; and Sakurai, Hidekazu, to Nippon Electric Co., Ltd. Device including a unit for feeding a recording medium at a predetermined speed to a unit for processing that provisional record into a final one which is formed on the medium fed at another speed. 4,115,817, Cl. 358-288.000.

Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Information transferring apparatus. 4,115,868, Cl. 364-900.000.

Suzuki, Tadao: *See—*
Yoshida, Tadao; and Suzuki, Tadao, 4,115,740, Cl. 330-264.000.

Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, to Asahi Glass Company Ltd. Sealing composition. 4,115,132, Cl. 106-53.000.

Suzuki, Yukio: *See—*
Matsuda, Yoshinobu; Suzuki, Yukio; and Yasui, Seimei, 4,115,437, Cl. 260-513.00R.

Sventsitsky, Alexandr Sergeevich: *See—*
Nudelman, Boris Izrailovich; Sventsitsky, Alexandr Sergeevich; Bikbau, Marsel Yanovich; Bun, Isaak Mozesovich; and Kevvai, Arnold Arnoldovich, 4,115,138, Cl. 106-100.000.

Swagelok Company: *See—*
Medvick, Richard J., 4,114,853, Cl. 251-149.600.

Swank, Roy L., to Pioneer Filters, Inc. Blood filtering apparatus of graduated fiber density. 4,115,277, Cl. 210-436.000.

Swarts, William A.: *See—*
McKellin, Wilbur H.; and Swarts, William A., 4,115,455, Cl. 260-610.00R.

Swaters, Pieter Dirk: *See—*
Havinga, Reginoldus; and Swaters, Pieter Dirk, 4,115,224, Cl. 204-159.180.

Sweany, Glenn A., to Continental Oil Company. Oil conversion process. 4,115,246, Cl. 208-56.000.

Sweeney, James E. Sled apparatus. 4,114,912, Cl. 280-12.0KL.

Swift, Graham: *See—*
Cenci, Harry J.; and Swift, Graham, 4,115,637, Cl. 526-56.000.

Swinney, Brian: *See—*
Colclough, Terence; and Swinney, Brian, 4,115,287, Cl. 252-48.200.

Swisher, Calvin C., Sr., to Wisconsin Centrifugal, Inc. Metal coupling or other metal attachment and method for welding it to a metal tube or other metal support. 4,115,019, Cl. 403-270.000.

Swodenk, Wolfgang: *See—*
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,115,462, Cl. 260-667.000.

Sybron Corporation: *See—*
Joslyn, Larry James, 4,115,068, Cl. 422-56.000.

System AB Infotenik: *See—*
Bjermo, Gote Herbert Egard; and Tresjo, Paul Einar, 4,114,753, Cl. 198-608.000.

Systems Consultants, Inc.: *See—*
Shulman, Lawrence M.; and Weingart, Norman, 4,114,450, Cl. 73-489.000.

Szpur, Roman. Method of manufacturing medical electrodes. 4,114,263, Cl. 29-630.00R.

Tachibana, Kyozaburo: *See—*
Sugimura, Yukio; Miyamoto, Norioki; Iwasaki, Tetsuji; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,115,103, Cl. 71-98.000.

Tachikawa, Hajime; and Satoh, Kenji, to Hitachi Heating Appliances Co., Ltd. Microwave oven. 4,115,678, Cl. 219-10.55B.

Tagawa, Tomiyasu: *See—*
Masuda, Tetsuzo; Tagawa, Tomiyasu; Yoshioka, Hachiro; and Akahoshi, Takashi, 4,115,071, Cl. 422-179.000.

Taisei Kensetsu Kabushiki Kaisha: *See—*
Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, 4,114,282, Cl. 33-180.00R.

Taitel, Charles M.; and Ryan, Ralph L., to JRC Products, Inc. Core locking device. 4,114,909, Cl. 279-1.00Q.

Takagi, Satoshi; Watanabe, Wataru; and Yokota, Tadashi, to Clarion Company Limited. Cartridge type magnetic tape recorders. 4,115,826, Cl. 360-96.000.

Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, to Konishiroku Photo Industry Co., Ltd. Color diffusion transfer process employing phosphoramides. 4,115,117, Cl. 96-29.00D.

Takahashi, Keikichi: *See—*
Matsuura, Eiichi; Takahashi, Keikichi; Tsukada, Nobuo; and Tatsumi, Yoshio, 4,114,365, Cl. 58-23.0BA.

Takahashi, Norio, to Kabushiki Kaisha Daini Seikosha. Driving pulse width controlling circuit for a transducer of an electronic timepiece. 4,114,364, Cl. 58-23.00D.

Takahashi, Reijiro; Musoh, Masanori; and Ito, Tosikazu, to Hitachi, Ltd. Evaporator. 4,114,397, Cl. 62-516.000.

Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha, Ltd. Pyridyl compound, herbicidal composition containing the same and method of use thereof. 4,115,102, Cl. 71-94.000.

Takahashi, Tetsuo: *See—*
Itoh, Tetsuro; Takahashi, Tetsuo; Kimura, Atsuyoshi; and Yamano, Seiichi, 4,115,111, Cl. 75-128.00P.

Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, to Mitsubishi Chemical Industries, Ltd. Method of treating exhaust gas discharged from nitric acid plant. 4,115,516, Cl. 423-239.000.

Takamiya, Toru: *See—*
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.

Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Compound matrix formation in an ink jet system printer. 4,115,788, Cl. 346-75.000.

Takei, Toshihiro: *See—*
Kasagi, Takao; Kuwakado, Satoshi; and Takei, Toshihiro, 4,114,924, Cl. 280-740.000.

Takeno, Tsuneyuki: *See—*
Sugimura, Yukio; Miyamoto, Norioki; Iwasaki, Tetsuji; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,115,103, Cl. 71-98.000.

Takezawa, Junichi: *See—*
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, 4,115,538, Cl. 424-1.000.

Takigawa, Yukio: *See—*
Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, 4,115,516, Cl. 423-239.000.

Talmage, Dennis D.: *See—*
Byrne, James C.; and Talmage, Dennis D., 4,115,723, Cl. 315-84.000.

Tamabayashi, Hanzo: *See—*
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,115,436, Cl. 260-505.00N.

Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,114,374, Cl. 60-302.000.

Tanaka, Atsuo, to Tomy Kogyo Co., Inc. Musical toy. 4,114,501, Cl. 84-330.000.

Tanaka, Katsumasa: *See—*
Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, 4,115,369, Cl. 526-65.000.

Tanaka, Masaaki: *See—*
Nohira, Hidetaka; and Tanaka, Masaaki, 4,114,575, Cl. 123-119.00A.

Tani, Zenpei: *See—*
Nakamura, Tutomu; Shigemasa, Junichiro; and Tani, Zenpei, 4,115,832, Cl. 361-256.000.

Tanisawa, Kuniaki: *See—*
Takahashi, Jiro; Miyamoto, Akihiko; Aoki, Tooru; Kunieda, Naoshi; and Tanisawa, Kuniaki, 4,115,117, Cl. 96-29.00D.

Tankred, Hans Jurgen; and Madsen, Per Johan, to Danfoss A/S. Motor compressor. 4,115,035, Cl. 417-312.000.

Tashiro, Yasuhisa: *See—*
Aoki, Shigeru; Tashiro, Yasuhisa; Aboshi, Yuzo; Narita, Toshiro; and Shirai, Tadashi, 4,115,439, Cl. 562-402.000.

Tatsuke, Hisashi: *See—*
Kanki, Hiroshi; Yasuda, Kazuyoshi; and Tatsuke, Hisashi, 4,114,819, Cl. 242-18.00R.

Tatsumi, Yoshio: *See—*
Matsuura, Eiichi; Takahashi, Keikichi; Tsukada, Nobuo; and Tatsumi, Yoshio, 4,114,365, Cl. 58-23.0BA.

Taub, Herman P., to Mediax, Inc. Table with integral projector. 4,114,291, Cl. 35-36.000.

Tauscher, Wolfgang G. Cartridge for tape-, ribbon-, or filament-like information storage media. 4,114,832, Cl. 242-194.000.

Taylor, Frank Howard, to Plessey Handel und Investments AG. Aircraft landing systems. 4,115,777, Cl. 343-108.00R.

Taylor, John Richard: *See—*
Commander, Robert Duncan; Gardner, Peter Alan Edward; and Taylor, John Richard, 4,115,823, Cl. 360-77.000.

Taylor, Lynn J., to Owens-Illinois, Inc. Process for producing glass article having fragment retaining and alkali resistant coating. 4,115,599, Cl. 427-55.000.

Tazume, Masayuki: *See—*
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.

TDK Electronics Co., Ltd.: *See—*
Kubota, Yuichi; and Kajimoto, Norifumi, 4,115,290, Cl. 252-62.540.

Teach, Eugene G.: *See—*
Lam, Hsiao Ling; and Teach, Eugene G., 4,115,556, Cl. 424-200.000.

Lam, Hsiao Ling; and Teach, Eugene G., 4,115,560, Cl. 424-211.000.

Tear, Brian John: *See—*
Chambers, Hubert Harold; and Tear, Brian John, 4,115,144, Cl. 106-300.000.

Tecumseh Products Company: *See—*
Gannaway, Edwin L., 4,115,044, Cl. 417-564.000.

Teijin Limited: *See—*
Inata, Hiroo; and Kawase, Shoji, 4,115,362, Cl. 528-190.000.
Mitsuishi, Yukio; Shiozaki, Shigeru; and Hasegawa, Kinji, 4,115,617, Cl. 428-336.000.

Teijin Seiki Company Limited: *See—*
Fukui, Kiyozumi, 4,114,737, Cl. 192-3.00N.

Teikoku Piston Ring Co., Ltd.: *See—*
Hane, Yoshio; Chino, Nobuo; Murata, Katsuhiro; and Harayama, Akira, 4,114,282, Cl. 33-180.00R.

Teisseire, Paul Jose: *See—*
Plattier, Marcel; and Teisseire, Paul Jose, 4,115,326, Cl. 252-522.000.

Tektronix, Inc.: *See—*
Prentice, Leon Austin, 4,115,655, Cl. 174-35.00R.

Teletype Corporation: *See—*
Nordin, Robert W., 4,114,751, Cl. 400-248.000.

Tell, Benjamin: *See—*
Kasper, Horst Manfred; Tell, Benjamin; and Wagner, Sigurd, 4,115,633, Cl. 429-191.000.

Tenna Power Corporation: *See—*
Young, Thomas A.; and Freimark, Ronald J., 4,115,729, Cl. 322-86.000.

Tenner, Arthur R.; and Turner, David W., to Exxon Research and Engineering Company. Method for reducing NO_x emission to the atmosphere. 4,115,515, Cl. 423-235.000.

Ter-Aganov, Grant Leonidovich: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Teramachi, Hiroshi. Double acting actuator. 4,114,517, Cl. 92-2.000.

Teramura, Hiroichi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,115,815, Cl. 358-260.000.

Terrill, David B.: *See—*
Shaw, Wilfrid G.; and Terrill, David B., 4,115,441, Cl. 562-534.000.

Terry, Ruel C., to In Situ Technology Inc. Minimizing environmental effects in production and use of coal. 4,114,688, Cl. 166-246.000.

Terrytune Developments Limited: *See—*
Dawkins, Terence Brian, 4,114,585, Cl. 123-191.00M.

Texaco Development Corp.: *See—*
Kennedy, William Alvis, 4,115,301, Cl. 521-155.000.
Schulze, Heinz; and Waddill, Harold G., 4,115,360, Cl. 528-94.000.
Schulze, Heinz; and Waddill, Harold G., 4,115,361, Cl. 260-47.0EN.
Schulze, Heinz, 4,115,446, Cl. 260-553.00R.

Texaco Exploration Canada Ltd.: *See—*
Cram, Phillip J.; and Redford, David A., 4,114,690, Cl. 166-261.000.

Texaco Inc.: *See—*
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,115,241, Cl. 208-33.000.
Harrison, Charles W.; Pitman, Herbert J.; and Sequeira, Avilino, 4,115,243, Cl. 208-33.000.
Harrison, Charles W.; and Watts, Leonard R., 4,115,245, Cl. 208-33.000.
Payton, Joy T., 4,114,687, Cl. 166-51.000.
Payton, Joy T., 4,114,691, Cl. 166-276.000.
Pitman, Herbert J.; Harrison, Charles W.; and Sequeira, Avilino, 4,115,244, Cl. 208-33.000.
Sequeira, Avilino; Pitman, Herbert J.; Harrison, Charles W.; and Quasny, Jerry E., 4,115,242, Cl. 208-33.000.

Texas Instruments Incorporated: *See—*
Bellavance, David Walter, 4,114,257, Cl. 29-572.000.
Frederiksen, John E., 4,114,362, Cl. 58-4.00A.
Lou, Perry W., 4,115,710, Cl. 307-304.000.
McElroy, David J., 4,115,705, Cl. 307-140.000.
Renner, Karl H.; and Williams, Clark Russell, 4,114,366, Cl. 58-50.00R.
Santala, Teuvo J.; and Hirsbrunner, Hans G., 4,115,325, Cl. 252-514.000.
Weber, Richard Martin; and Bedenbender, John William, 4,114,722, Cl. 181-114.000.
Wood, James Carlos; and Felcman, Frances Adolph, 4,115,014, Cl. 400-611.000.

Textron, Inc.: *See—*
Drees, Jan M.; Sonneborn, Walter G. O.; and Yen, Jing G., 4,115,031, Cl. 416-134.00A.
Macfee, Norman W., 4,115,489, Cl. 264-23.000.

TH. Goldschmidt AG: *See—*
Greinacher, Ekkehard; Reinhardt, Klaus; and Strnat, Karl, 4,115,159, Cl. 148-105.000.

Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Gas phase aromatic hydrogenation using palladium lithium aluminum spinel catalyst. 4,115,462, Cl. 260-667.000.

Theodorakis, Michael C.: *See—*
Digenis, George A.; Shambhu, Manvendra B.; and Theodorakis, Michael C., 4,115,540, Cl. 424-1.000.

Theodoropulos, Spyros: *See—*
Eisenhardt, William Anthony, Jr.; Hedaya, Eddie; and Theodoropulos, Spyros, 4,115,539, Cl. 424-1.000.

Thermo-Lab Instruments, Inc.: *See—*
Capone, David M., 4,115,229, Cl. 204-195.00S.
Capone, David M., 4,115,235, Cl. 204-195.00S.

Theron, Didier, to Regie Nationale des Usines Renault. Pipe, in particular an exhaust pipe for motor vehicles. 4,114,715, Cl. 180-64.00A.

Thevin, Rene Roger: *See—*
Lalande, Jacques Alfred; and Thevin, Rene Roger, 4,115,743, Cl. 331-14.000.

Thibault, Louis Robert; and Dy Yau, Leopoldo, to Bell Telephone Laboratories, Incorporated. Reliable metal-to-junction contacts in large-scale-integrated devices. 4,114,256, Cl. 29-571.000.

Thiele, Carl L.; and Shapiro, Haskell, to Royal Industries, Inc. Vehicle wheel alignment system. 4,115,007, Cl. 356-155.000.

Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, to Siegfried Aktiengesellschaft. Pyridyl alkyl esters of substituted phenoxy alkanoic acids having the ability to reduce the level of fatty substances in the blood. 4,115,393, Cl. 260-295.50R.

Thien, Gerhard: *See—*
Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, 4,114,714, Cl. 180-54.00A.

Thissen, Christopher P. Waste water treatment rotor. 4,115,268, Cl. 210-150.000.

Thoma, Georg; and Muller, Hans, to Maschienefabrik Memmingen KG. Ing. Theodor Otto. Method and apparatus for winding rapidly running thread. 4,114,821, Cl. 242-43.00R.

Thomas, Robert Nason. Vertical windmill. 4,115,027, Cl. 415-2.000.

Thompson, Gerald L.; and Paschal, Gloria C., to Eli Lilly and Company. 3'-Oxygenated derivatives of 4'-deoxy VLB "A" and "B" and related 1-formyl compounds. 4,115,388, Cl. 260-287.00B.

Thomson-CSF: *See—*
Beauvais, Thierry; and Souchay, Philippe, 4,115,865, Cl. 364-604.000.
Reymond, Jean-Claude; and Bellissant, Alain, 4,115,006, Cl. 356-152.000.

Thorell, Rook O.; and Ring, Roger R. Vehicle hitch. 4,114,921, Cl. 280-478.00B.

Thoren, Torgny A. Building component. 4,114,334, Cl. 52-303.000.

Thornton, Charles G., deceased: *See—*
daCosta, Harry H.; Foster, Victor W.; and Thornton, Charles G., deceased, 4,115,713, Cl. 310-49.00R.

Thornton, Ella J., heir: *See—*
daCosta, Harry H.; Foster, Victor W.; and Thornton, Charles G., deceased, 4,115,713, Cl. 310-49.00R.

Thorpenco (Sales & Service Ltd.): *See—*
Grey, John Constantine, 4,114,403, Cl. 64-15.00B.

Thrush, Edward John, to International Standard Electric Corporation. Gallium arsenide photocathodes. 4,115,223, Cl. 204-129.600.

Thun, Niels, to Danfoss A/S. Apparatus for ultrasonic measurement. 4,114,457, Cl. 73-632.000.

Thyssen Industrie Aktiengesellschaft: *See—*
Schwendt, Lutz, 4,114,512, Cl. 89-36.00K.

Tibolla, Marcello: *See—*
Doria, Gianfederico; Giraldi, PierNicola; Lauria, Francesco; Corno, Maria Luisa; Sberze, Piero; and Tibolla, Marcello, 4,115,567, Cl. 424-250.000.

Timofeev, Boris Petrovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 4,114,638, Cl. 137-242.000.

Tirpak, Michael R.: *See—*
Alsberg, Henry; Skalla, Dale W.; and Tirpak, Michael R., 4,115,478, Cl. 260-880.00R.

Titkova, Tatyana Dmitrievna: *See—*
Mukhamedyarov, Rashid Mustafievich; Smirnov, Boris Andreevich; Sery, Stanislav Vasilievich; Titkova, Tatyana Dmitrievna; and Lokalov, Anatoly Ivanovich, 4,115,272, Cl. 210-266.000.

Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Smolyanitsky, Boris Nikolaevich; Plavskikh, Vladimir Dmitrievich; and Boginsky, Vladimir Petrovich. Pneumatic apparatus of the percussive type. 4,114,700, Cl. 175-19.000.

Toa Paint Co., Ltd.: *See—*
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.

Tobita, Takashi: *See—*
Yoshihara, Hiroshi; Tobita, Takashi; Tomizawa, Ryoichi; and Ishikawa, Kunio, 4,115,415, Cl. 260-410.000.

Toefting, Verner: *See—*
Lange, Kai; Toefting, Verner; Wiesen, Ernest J.; and Lijewski, Robert R., 4,115,694, Cl. 250-363.00S.

Toft, Kenneth Herman, to Simon-Hartley Limited. Apparatus for separation of oil from oil and water mixtures. 4,115,279, Cl. 210-521.000.

Toi, Hiroshi: *See—*
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.

Tokico Ltd.: *See—*
Kato, Tetuo, 4,114,735, Cl. 188-282.000.
Kato, Tetuo, 4,114,866, Cl. 267-64.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kogure, Yoichi; Minoura, Toshimi; and Fujiwara, Toshio, 4,115,848, Cl. 364-107.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Higuchi, Iwao; and Fujita, Takashi, 4,115,676, Cl. 219-10.49R.
Iwasaki, Kenji; and Hijikata, Sotaro, 4,115,717, Cl. 313-59.000.
Kubo, Daijiro; and Hashimoto, Masaru, 4,115,748, Cl. 331-111.000.
Masuoka, Fujio; and Iizuka, Hisakazu, 4,115,795, Cl. 357-24.000.
Ohno, Masayoshi; Kakuta, Akio; Miyauchi, Terukatsu; and Kikuchi, Tatsuji, 4,115,081, Cl. 55-64.000.
Shimizu, Wataru; and Sawaoka, Eiji, 4,114,998, Cl. 355-3.0DR.
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,115,868, Cl. 364-900.000.
Yamaguchi, Tetsuo, 4,115,706, Cl. 307-209.000.
Yamamura, Hideo; Matsuo, Katsuharu; and Nagai, Nobuyuki, 4,115,677, Cl. 219-10.49R.

Tollkotter, Gunther: *See—*
Dieckelmann, Gerhard; Jeromin, Lutz; and Tollkotter, Gunther, 4,115,411, Cl. 260-348.260.

Tomasicchio, Giorgio: *See—*
Jukkola, Walfred Wilhelm; and Tomasicchio, Giorgio, 4,115,070, Cl. 422-142.000.

Tominaga, Yoichi; and Shibahara, Yasuo, to Sanyo Chemical Industries, Ltd. Surface sizing compositions for paper. 4,115,331, Cl. 260-17.4CL.

Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Channel processor. 4,114,495, Cl. 84-1.010.

Tomita, Tadayoshi: *See—*
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.

Tomizawa, Ryoichi: *See—*
Yoshihara, Hiroshi; Tobita, Takashi; Tomizawa, Ryoichi; and Ishikawa, Kunio, 4,115,415, Cl. 260-410.000.

Tomotsu, Takeshi: *See—*
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.

Tomson, Elizabeth C.: *See—*
Newell, William K.; and Tom.. ., Elizabeth C., 4,114,913, Cl. 280-12.00H.

Tomy Kogyo Co., Inc.: *See—*
Tanaka, Atsuo, 4,114,501, Cl. 84-330.000.

Topolyansky, Jury Arnoldovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Topura Co., Ltd. (Kabushiki Kaisha Tohpura): *See—*
Akashi, Tetsuya; and Nikawa, Akio, 4,114,670, Cl. 151-41.720.

Toray Industries, Inc.: *See—*
Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, 4,114,358, Cl. 57-51.000.

Torii, Osamu, to Ancos Co., Ltd. Retractable pen with internal tip seating. 4,115,015, Cl. 401-110.000.

Torimaru, Yasuo: *See—*
Fujimoto, Takeo; Torimaru, Yasuo; Ogawa, Shin-ichi; and Yasue, Shinya, 4,115,796, Cl. 357-42.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Manabe, Takao; and Matunaga, Sigetugu, 4,114,545, Cl. 112-121.150.

Toti, Andrew J. Method of assembling a panel assembly structure. 4,114,247, Cl. 29-453.000.

Toukan, Sameeh Said: *See—*
Bohen, Joseph Michael; and Toukan, Sameeh Said, 4,115,352, Cl. 260-45.75B.

Towmotor Corporation: *See—*
Brown, Vaikai K.; and Fatur, Richard N., 4,114,738, Cl. 192-4.00A.

Toyo Boseki Kabushiki Kaisha: *See—*
Otani, Sugio; Watanabe, Shoji; and Araki, Tadashi, 4,115,527, Cl. 423-447.400.

Toyo Denki Kogyosho Co., Ltd.: *See—*
Araoka, Toshinobu, 4,114,955, Cl. 302-15.000.

Toyo Engineering Corporation: *See—*
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, 4,115,074, Cl. 48-95.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Ohkawa, Kozo, 4,114,550, Cl. 113-7.00R.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Fujii, Hideo; Fujiki, Tokio; Uemura, Masaru; and Sakura, Masakazu, 4,115,181, Cl. 156-497.000.
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,115,436, Cl. 260-505.00N.

Toyoda Gosei Co., Ltd.: *See—*
Ito, Keizo, 4,114,339, Cl. 52-507.000.

Toyoda-Koki Kabushiki Kaisha: *See—*
Otsu, Ikuo; and Onishi, Akiyoshi, 4,114,461, Cl. 74-29.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, 4,114,576, Cl. 123-119.00A.
Nohira, Hidetaka; and Tanaka, Masaaki, 4,114,575, Cl. 123-119.00A.
Tanahashi, Toshio, 4,114,374, Cl. 60-302.000.
Yamakawa, Yoshio; Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,114,569, Cl. 123-30.00D.
Yanagihara, Hiromichi; and Habu, Nobuo, 4,114,568, Cl. 123-30.00D.

Tracy, John M., to United States of America, Air Force. Probe station. 4,115,736, Cl. 324-158.00F.

Trans-Aid Corporation: *See—*
Oye, Lloyd J.; and Ogden, Barry, 4,114,965, Cl. 312-209.000.

Trans World Technology Laboratories, Inc.: *See—*
Habib, David P.; and Gager, Morgan E., 4,114,926, Cl. 282-27.500.

Travnicek, Edward A., to American Optical Corporation. Finished silicone contact lenses. 4,114,993, Cl. 351-160.000.

Tres, Ercole: *See—*
Giacoppo, Guglielmo; and Tres, Ercole, 4,115,665, Cl. 179-98.000.

Tresjo, Paul Einar: *See—*
Bjermo, Gote Herbert Egard; and Tresjo, Paul Einar, 4,114,753, Cl. 198-608.000.

Tresselt, Carl P., to Bendix Corporation, The. CW radar AM-noise video-cancellation system. 4,115,774, Cl. 343-17.700.

Trickett, Elizabeth A.: *See—*
Auborn, James J.; and Trickett, Elizabeth A., 4,115,526, Cl. 423-440.000.

Troy, M. Frank, to Vapor Corporation. Modulating failsafe valve actuator using differential gearing. 4,114,465, Cl. 74-89.170.

Trubenised (Sales) Limited: *See—*
Laws, Arthur Ernest, 4,114,278, Cl. 33-23.00K.

Trubin, Vladimir Fomich; and Redin, Alexei Alexandrovich. Mechanism for compensating the length of a weft thread for a loom. 4,114,658, Cl. 139-452.000.

Truscott, John Compton, to General Electric Company. Computed tomography scanner. 4,115,696, Cl. 250-445.00T.

TRW Inc.: *See—*
Kraus, Willibald; and Greulich, Bodo Arthur, 4,114,972, Cl. 339-65.000.

Tschopp, Paul: *See—*
Evans, Graham; Fryberg, Mario; Stauner, Thomas; Tschopp, Paul; and Leppard, David G., 4,115,121, Cl. 96-56.300.

Tsimbler, Jury Abramovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gvozdev, Vladimir Nikolaevich; Geints, Dmitry Evgenievich; Gun, Dmitry Rudolfovich; Dokin, Viktor Alexeevich; Dubner, Evgeny Mikhailovich; Kantor, Ilya Solomonovich; Lachinov, Evgeny Alexandrovich; Topolyansky, Jury Arnoldovich; Tsimbler, Jury Abramovich; and Chernikin, Alexei Vadimovich, 4,114,835, Cl. 243-32.000.

Tsubouchi, Hiromitsu: *See—*
Sugiura, Teruo; Tsubouchi, Hiromitsu; Ishida, Nobuyasu; and Kobayashi, Kiyonori, 4,114,740, Cl. 192-70.180.

Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, to Toray Industries, Inc. Method and apparatus for commencing the yarn forming operation of a fasciated yarn. 4,114,358, Cl. 57-51.000.

Tsuchida, Shozo: *See—*
Okai, Sakuo; and Tsuchida, Shozo, 4,115,119, Cl. 96-35.100.
Okai, Sakuo; and Tsuchida, Shozo, 4,115,123, Cl. 96-79.000.

Tsuchida, Yuhkichi: *See—*
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.

Tsujii, Yasuhiro: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,115,102, Cl. 71-94.000.

Tsujino, Nobuyuki: *See—*
Adachi, Keiichi; Ikeda, Tadashi; and Tsujino, Nobuyuki, 4,115,122, Cl. 96-76.00R.

Tsukada, Nobuo: *See—*
Matsuura, Eiichi; Takahashi, Keikichi; Tsukada, Nobuo; and Tatsumi, Yoshio, 4,114,365, Cl. 58-23.0BA.

Tsukamoto, Takeo; Okamura, Miyoshi; and Kutami, Toshio, to Nihon Kagaku Sangyo Co., Ltd. Process for metal plating on aluminum and aluminum alloys. 4,115,211, Cl. 204-37.00R.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Device for preventing leakage current in light responsive circuit. 4,115,790, Cl. 354-60.00R.

Tsutsumi, Toshinori: *See—*
Takami, Koichi; Abe, Shingo; Takigawa, Yukio; Tsutsumi, Toshinori; and Kinsho, Yoshio, 4,115,516, Cl. 423-239.000.

Tunnicliffe, Leonard Alfred, to L.A. & E.W. Tunnicliffe Limited. Darts. 4,114,884, Cl. 273-106.50C.

Tupper, David Edward: *See—*
Chakrabarti, Jiban Kumar; and Tupper, David Edward, 4,115,568, Cl. 424-250.000.
Chakrabarti, Jiban Kumar; and Tupper, David Edward, 4,115,574, Cl. 424-250.000.

Turk, Chester F.: *See—*
Krapcho, John; and Turk, Chester F., 4,115,382, Cl. 260-239.00A.

Turner, David W.: *See—*
Tenner, Arthur R.; and Turner, David W., 4,115,515, Cl. 423-235.000.

Turner, James Keith; and Sturkey, William Cleere, to Gaston County

Dyeing Machine Company. Soft flow jet dyeing machine. 4,114,407, Cl. 68-178.000.
Turner, Thomas D.; and Benson, Alan R. Apparatus for infusion of a measured volume of blood. 4,114,617, Cl. 128-214.00R.
U C B, Societe Anonyme: *See—*
Strubbe, Joseph, 4,115,579, Cl. 424-274.000.
Ubaldi, Luciano; and Buccella, Osvaldo, to Elettrocarbonium S.p.A. Impregnation furnaces for carbon articles. 4,114,562, Cl. 118-50.000.
Ubbels, Jacob: *See—*
Driessen, Frans M.; Ubbels, Jacob; and Stadhouders, Jacobus J., 4,114,525, Cl. 99-465.000.
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, to Hitachi, Ltd. Method and device for recognizing a specific pattern. 4,115,761, Cl. 340-146.3AC.
Ueda, Takeshi: *See—*
Okubo, Masao; Miki, Masayoshi; and Ueda, Takeshi, 4,115,148, Cl. 134-21.000.
Uemura, Masaru: *See—*
Fujii, Hideo; Fujiki, Tokio; Uemura, Masaru; and Sakura, Masakazu, 4,115,181, Cl. 156-497.000.
Ueno, Ichiro, to Victor Company of Japan, Limited. Laser beam system for optically recording information signals on a record disc. 4,115,809, Cl. 358-128.000.
Uesaka, Ikuo: *See—*
Kato, Hideo; Koshinaka, Eiichi; Kurata, Sakae; and Uesaka, Ikuo, 4,115,392, Cl. 260-295.50R.
Ui, Michio: *See—*
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, 4,115,538, Cl. 424-1.000.
Uman, Martin Allan: *See—*
Krider, Edmund Philip; Noggle, Ralph Carl; and Uman, Martin Allan, 4,115,732, Cl. 324-72.000.
Umeda, Ikuo: *See—*
Takano, Rikuo; Matsunaga, Mitsushi; Tsuchida, Yuhkichi; Sumitomo, Yuji; Umeda, Ikuo; and Aiba, Masahiko, 4,115,788, Cl. 346-75.000.
Umeda, Katsuhiko, to Shin Nihon Koku Seibi K.K. Caster with braking mechanism. 4,114,232, Cl. 16-35.00R.
Umehara, Kunio: *See—*
Kosaka, Kimito; Umehara, Kunio; and Maruyama, Takeshi, 4,115,814, Cl. 358-243.000.
Umemura, Toshikazu: *See—*
Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, 4,115,369, Cl. 526-65.000.
Unibra: *See—*
Delmon, Bernard; and Van Houte, Ghislain, 4,115,518, Cl. 423-244.000.
Unie Van Kunstmestfabrieken, B.V.: *See—*
Biermans, Andreas J.; and Jonckers, Kees, 4,115,449, Cl. 260-555.00A.
Unimation: *See—*
Lindbom, Torsten H., 4,115,684, Cl. 219-124.220.
Union Camp Corporation: *See—*
Lawson, Nelson E., 4,115,330, Cl. 260-26.000.
Union Carbide Corporation: *See—*
Alderfer, Richard Bernhard; and Scheibner, Gerald Harry, 4,115,048, Cl. 425-72.00R.
Brown, Gary Leigh; Cummings, Weldon Clifford; and Levine, Isaac Jacob, 4,115,639, Cl. 526-130.000.
Cosby, Lowell Alan; Fiato, Rocco Anthony; and Vidal, Jose Luis, 4,115,433, Cl. 260-449.00L.
Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,115,520, Cl. 423-287.000.
Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,115,521, Cl. 423-294.000.
Eisenhardt, William Anthony, Jr.; Hedaya, Eddie; and Theodoropulos, Spyros, 4,115,539, Cl. 424-1.000.
Fuhrhop, Ronald Elmer, 4,115,154, Cl. 148-9.500.
Higgins, Thomas Engel; Ross, Camilla Brems; and Snella, Henry John, 4,115,594, Cl. 426-140.000.
Karol, Frederick John; Wu, Chisung; Reichle, Walter Thomas; and Maraschin, Norma Jean, 4,115,425, Cl. 260-438.50R.
Sandner, Michael Ray; and Prokai, Bela, 4,115,321, Cl. 252-431.00C.
Vidal, Jose Luis; Mester, Zoltan Csaba; and Walker, Wellington Epler, 4,115,428, Cl. 260-449.00L.
Warren, Peter Carter, 4,114,226, Cl. 15-236.00R.
Union Oil Company of California: *See—*
Engle, Donald D., Jr.; and Utt, Michael E., 4,114,393, Cl. 114-264.000.
Gallus, Julius P., 4,114,692, Cl. 166-293.000.
Uniroyal, Inc.: *See—*
Baboff, Leon Ian; Shichman, Daniel; and Reed, Lawrence Paul, 4,115,172, Cl. 156-115.000.
Mao, Chung-Ling, 4,115,302, Cl. 521-115.000.
O'Brien, John T.; and White, Woodrow W., 4,115,435, Cl. 260-465.400.
Unit Process Assemblies, Inc.: *See—*
Weinstock, Jacques; Lieber, Derek; and Hay, William Dunning, 4,115,690, Cl. 250-308.000.
United Aircraft Products, Inc.: *See—*
Simmons, Carl E., 4,114,395, Cl. 62-386.000.
U.S. Blind Stitch Machine Corp.: *See—*
Russell, Richard, 4,114,547, Cl. 112-178.000.
United States of America
Agriculture: *See—*
Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., 4,115,422, Cl. 260-429.300.
Air Force: *See—*
Bostick, Hoyt A.; Sutton, Paul M.; and Richards, Chester L., 4,114,978, Cl. 350-1.700.
Brown, Herbert R., 4,114,840, Cl. 244-152.000.
Browning, Charles E., 4,114,420, Cl. 73-15.600.
Cole, Sidney Michael; and Clouser, Paul Lee, 4,115,749, Cl. 333-31.00R.
Evers, Robert C., 4,115,367, Cl. 528-210.000.
Grant, Louis R., Jr., 4,115,459, Cl. 260-644.000.
Harrington, John J., 4,115,775, Cl. 343-18.00B.
Heitz, Roger M.; and Hill, Franklin, 4,115,616, Cl. 428-310.000.
Horton, Michael L.; and Harris, Alan M., 4,114,352, Cl. 54-79.000.
Prince, Ronald E.; and Bonnette, Rene W., 4,114,510, Cl. 89-12.000.
Schwerdtfeger, Lee; Stillman, Lee E.; and Frain, William E., 4,115,784, Cl. 343-915.000.
Tracy, John M., 4,115,736, Cl. 324-158.00F.
America: *See—*
Gale, Glen Roy; and Meischen, Sandra Jan, 4,115,418, Cl. 260-429.00R.
Army: *See—*
Adamson, James R., Jr., 4,114,855, Cl. 254-175.500.
Balcerak, Raymond S.; and Garn, Lynn E., 4,115,692, Cl. 250-338.000.
Reggia, Frank, 4,115,783, Cl. 343-792.000.
Energy: *See—*
Clarke, John F., 4,115,190, Cl. 176-3.000.
Fort, William G. S.; and Lee, William W., Jr., 4,115,073, Cl. 23-293.00R.
Kinoshita, Kimio; and Ackerman, John P., 4,115,632, Cl. 429-188.000.
Sepelak, George R., 4,115,193, Cl. 176-87.000.
Sump, Kenneth R., 4,115,311, Cl. 252-301.10W.
Winston, Roland, 4,114,592, Cl. 126-270.000.
Health, Education and Welfare: *See—*
Silberberg, Jeffrey L., 4,115,733, Cl. 324-99.00D.
Navy: *See—*
Crowley, Donald P., 4,114,369, Cl. 60-200.00A.
Hannemann, Dennis M.; Huang, Kwang Ta; and Shiroma, Dallas M., 4,115,704, Cl. 307-64.000.
Ott, Edward; and Manheimer, Wallace M., 4,115,191, Cl. 176-3.000.
Sbrocca, Dino A., 4,115,167, Cl. 149-19.500.
Shajenko, Peter, 4,115,753, Cl. 340-6.00R.
U.S. Philips Corporation: *See—*
Eggelsmann, Harry, 4,115,718, Cl. 313-60.000.
Horowitz, Alexandre; Kymmell, Georg Rudolph Wolter; Krijne, Johannes; Beusink, Bernard Joseph, deceased; and De Haan, Friedrich Jacobus, administrator, 4,114,406, Cl. 68-24.000.
Moussie, Michel, 4,115,711, Cl. 307-350.000.
Paterson, David, 4,115,036, Cl. 417-322.000.
United Technologies Corporation: *See—*
Christner, Larry G.; Nagle, Dennis C.; and Watson, Paul R., 4,115,528, Cl. 423-449.000.
Christner, Larry G.; and Nagle, Dennis C., 4,115,627, Cl. 429-44.000.
Cotton, Lou S., 4,115,755, Cl. 340-27.00R.
Cruff, Carlton E.; and Harrison, William E., 4,114,285, Cl. 34-29.000.
Smith, William E.; and Nelson, Roy G., 4,114,248, Cl. 29-460.000.
Stoltze, Leon; and Graff, John M., 4,115,611, Cl. 428-174.000.
Universal Power Corporation: *See—*
Carpentier, Theodore, 4,114,468, Cl. 74-410.000.
University of Alabama in Birmingham: *See—*
McGhee, Jerry R.; and Schaefer, Milton E., 4,114,605, Cl. 128-2.00F.
University of Arizona Foundation, The: *See—*
Krider, Edmund Philip; Noggle, Ralph Carl; and Uman, Martin Allan, 4,115,732, Cl. 324-72.000.
University of Iowa Research Foundation, The: *See—*
Norbeck, Edwin, 4,114,500, Cl. 84-385.00P.
University of Kentucky Research Foundation, The: *See—*
Digenis, George A.; Shambhu, Manvendra B.; and Theodorakis, Michael C., 4,115,540, Cl. 424-1.000.
University of Queensland, The: *See—*
Henry, Dick Peter, 4,115,593, Cl. 426-53.000.
Unland, Mark L.; and Barker, George E., to Monsanto Company. Zeolite catalyst. 4,115,424, Cl. 252-432.000.
Uno, Takeshi: *See—*
Ueda, Hirotada; Uno, Takeshi; Ejiri, Masakazu; Ikeda, Sadahiro; and Matsuoka, Shinji, 4,115,761, Cl. 340-146.3AC.
UOP Inc.: *See—*
Adams, Frank H.; and Knapik, H. Peter G., 4,115,253, Cl. 208-139.000.
Antos, George J., 4,115,252, Cl. 208-139.000.
Antos, George J., 4,115,254, Cl. 208-139.000.
Hayes, John C.; and Pollitzer, Ernest L., 4,115,255, Cl. 208-143.000.
Upjohn Company, The: *See—*
Chakirof, Dimitri A., 4,115,300, Cl. 521-171.000.
Lednicer, Daniel, 4,115,589, Cl. 424-330.000.
Miller, William L., Jr., 4,115,586, Cl. 424-317.000.

Moon, Malcolm W.; and Kornis, Gabriel, 4,115,649, Cl. 544-140.000.
Muhle, Dietrich, 4,115,066, Cl. 422-133.000.
Muhle, Dietrich, 4,115,299, Cl. 521-170.000.
Nelson, Norman A., 4,115,454, Cl. 260-590.00C.
Onder, Kemal B., 4,115,372, Cl. 528-73.000.
Sanson, Joseph F., 4,115,170, Cl. 156-79.000.
Smith, Herman W., 4,115,651, Cl. 560-55.000.
Ursprung, Joseph J., 4,115,396, Cl. 260-296.00R.

Urabe, Hiroyuki: *See—*
Sugio, Akitoshi; Furusawa, Tomotaka; Tanaka, Katsumasa; Umemura, Toshikazu; and Urabe, Hiroyuki, 4,115,369, Cl. 526-65.000.

Ursprung, Joseph J., to Upjohn Company, The. Pyridine n-oxides. 4,115,396, Cl. 260-296.00R.

Uskokovic, Milan Radoje: *See—*
Chadha, Naresh Kumar; Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,115,452, Cl. 260-586.00R.

Usui, Kazuhisa; and Muto, Osamu, to Sawafuji Denki Kabushiki Kaisha. Overrunning clutch device for engine starting unit. 4,114,746, Cl. 192-104.00R.

Usui, Motosuke: *See—*
Kon, Tsuneyoshi; Toi, Hiroshi; Matsuura, Tamiaki; Akanuma, Kiyohiko; Takamiya, Toru; and Usui, Motosuke, 4,114,252, Cl. 29-563.000.

UTITA S.p.A. Officine e Fonderie di Este: *See—*
Sighieri, Pierluigi; and Colleoni, Gianfranco, 4,114,790, Cl. 226-91.000.

UTM Power Products, Inc.: *See—*
Polidori, Mario, 4,114,977, Cl. 339-270.00R.

Utt, Michael E.: *See—*
Engle, Donald D., Jr.; and Utt, Michael E., 4,114,393, Cl. 114-264.000.

Uvarova-Nistratova, Ida Timofeevna: *See—*
Nudelman, Boris Izrailovich; Sharova, Valentina Petrovna; Ter-Aganov, Grant Leonidovich; Sosenko, Lev Matveevich; Bikbau, Marsel Yanovich; Kulabukhov, Vadim Alexandrovich; Sheludko, Valentin Vasilievich; Uvarova-Nistratova, Ida Timofeevna; Simon, Albert Pavlovich; Perlin, Boris Abramovich; Chepkalenko, Mikhail Gavrilovich; Gasanova, Alevtina Anatolievna; Galimova, Guzal Abdulkhaevna; Bodyagina, Rashida Gafievna; Kevvai, Arnold Arnoldovich; Albats, Boris Samuilovich; and Babin, Gennady Andreevich, 4,115,137, Cl. 106-100.000.

Uvetex Glarus AG.: *See—*
de Buck van Overstraeten, Jean-Pierre, 4,115,615, Cl. 428-229.000.

Vagi, Robert J. Deflector control circuit. 4,114,987, Cl. 350-285.000.

Vahlensieck, Hans-Joachim: *See—*
Kotzsch, Hans-Joachim; Draese, Rudiger; and Vahlensieck, Hans-Joachim, 4,115,427, Cl. 260-448.20E.

Vairel, Edmond: *See—*
Lormeau, Jean-Claude; Goulay, Jean; and Vairel, Edmond, 4,115,551, Cl. 424-105.000.

Val-Trac Incorporated: *See—*
Hamilton, Gerald A., 4,114,233, Cl. 16-95.00R.

Valantin, Alfred Alphonse Marie, to Charbonnages de France. Roof support. 4,114,385, Cl. 405-298.000.

Valdes, Sergio F., to International Telephone and Telegraph Corporation. Pseudo-noise radar system. 4,115,772, Cl. 343-6.50R.

Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Detent UHF tuner with memory type independent fine tuning. 4,114,459, Cl. 74-10.410.

Valentine, Donald Herman, Jr., to Hoffmann-La Roche Inc. Asymmetric hydrogenation catalyzed by rhodium complexes of chiral tertiary phosphines. 4,115,417, Cl. 260-413.000.

Valyi, Emery I. Method for controlled processing of blown plastic articles. 4,115,494, Cl. 264-89.000.

Van Products, a Division of Standex International Corporation: *See—*
Heimbrock, Henry H., 4,114,971, Cl. 339-59.00R.

van der Lely, Ary, to C. van der Lely N.V. Rotary harrow with pivotable coupling assembly. 4,114,695, Cl. 172-47.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N.V. Cultivators. 4,114,696, Cl. 172-59.000.

Vandervort, John D., to Minnesota Mining & Manufacturing Company. Hinge structure for platen covers. 4,114,236, Cl. 16-142.000.

Van Dyke, Dave: *See—*
Nelson, David H., 4,115,177, Cl. 156-245.000.

Van Dyke, Homer: *See—*
Nelson, David H., 4,115,177, Cl. 156-245.000.

van Hesden, Jan Willem, to Borg-Warner Corporation. Cutting oil additives. 4,115,285, Cl. 252-32.500.

Van Hoose, William E. Universal joint embodying oscillating drive pin. 4,114,401, Cl. 64-7.000.

Van Houte, Ghislain: *See—*
Delmon, Bernard; and Van Houte, Ghislain, 4,115,518, Cl. 423-244.000.

Van Leeuwen, Egon. Solar heater and element therefor. 4,114,598, Cl. 126-271.000.

Van Ommering, Gerrit; Stockel, Joseph F.; and Dunlop, James D., to Communications Satellite Corporation. Metal-hydrogen battery. 4,115,630, Cl. 429-72.000.

Van Orden, John J. Retractable mailbox. 4,114,801, Cl. 232-17.000.

Van Steveninck, Johannes; and Lincklaen Arriens, Jan, to Shell Oil Company. Burying a conduit in the bottom of a body of water. 4,114,390, Cl. 405-163.000.

Vantellini, Carlo: *See—*
Laface, Carmelo; and Vantellini, Carlo, 4,115,664, Cl. 179-84.00R.

Vapor Corporation: *See—*
Troy, M. Frank, 4,114,465, Cl. 74-89.170.

Varadi, Andrew G., to National Semiconductor Corporation. MOS random memory array. 4,115,871, Cl. 365-149.000.

Vargas, Jorge J. Catheter assembly. 4,114,618, Cl. 128-214.400.

Varian Associates, Inc.: *See—*
Bell, Ronald L., 4,115,149, Cl. 136-89.0PC.

Varta Batterie Aktiengesellschaft: *See—*
Lindenberg, Hans-Georg; Illmann, Joachim; and Golz, Hans-Joachim, 4,114,649, Cl. 137-625.190.
Sauer, Hans; and Spahrbier, Dieter, 4,115,626, Cl. 429-27.000.

Vassiliades, Anthony E.; Vincent, David N.; and Shroff, Shrenik, to Champion International Corporation. Grafted, polymeric microcapsular system. 4,115,474, Cl. 260-855.000.

Vaughn, James C. Muzzle loading firearm. 4,114,303, Cl. 42-51.000.

Veb Jenapharm: *See—*
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,115,443, Cl. 562-402.000.

Veber, Daniel F., to Merck & Co., Inc. Somatostatin analogs. 4,115,554, Cl. 424-177.000.

Velenyi, Louis J.: *See—*
Bartek, Joseph P.; Dolhyj, Serge R.; Velenyi, Louis J.; and Grasselli, Robert K., 4,115,464, Cl. 260-668.00C.

Verbanac, Frank: *See—*
Young, Austin H.; and Verbanac, Frank, 4,115,332, Cl. 260-17.4GC.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Loibl, Lorenz; and Scheurecker, Werner, 4,114,679, Cl. 164-426.000.

Verlinden, Michel Francois Emile Jacques, to Hamon Sobelco S.A. Flexible tube type fluid-fluid heat exchanger. 4,114,683, Cl. 165-78.000.

Verse, Egon, to Fa. August Thiele. Locking element for connecting chain links. 4,114,367, Cl. 59-85.000.

Verstegen, Johannes D. M., to Stamicarbon, B.V. Recovery of styrene from cracked hydrocarbon fractions. 4,115,208, Cl. 203-81.000.

Vertongen, Jose J. A.: *See—*
Bechet, Henri L. J.; and Vertongen, Jose J. A., 4,114,336, Cl. 52-280.000.

Vestergaard, Jorgen H., to General Electric Company. Process for preparing aromatic carbonate polymers. 4,115,358, Cl. 528-196.000.

Vibrabrush, Inc.: *See—*
Howa, Scott P., 4,114,271, Cl. 32-2.000.

Vick, Howard Andrew; and Johnson, Donald B., to Hycel, Inc. Fail safe detector in a cardiac monitor. 4,115,864, Cl. 364-550.000.

Victor Company of Japan, Limited: *See—*
Kitazawa, Kunihiko; Mimura, Masuichiro; and Iwata, Mitsuo, 4,115,822, Cl. 360-74.000.
Ueno, Ichiro, 4,115,809, Cl. 358-128.000.

Vidal, Jose Luis; Mester, Zoltan Csaba; and Walker, Wellington Epler, to Union Carbide Corporation. Catalyst and process for producing polyhydric alcohols and derivatives. 4,115,428, Cl. 260-449.00L.

Vidal, Jose Luis: *See—*
Cosby, Lowell Alan; Fiato, Rocco Anthony; and Vidal, Jose Luis, 4,115,433, Cl. 260-449.00L.

Vidra, James David; and Nachtigal, Julius Harvey, to Colgate Palmolive Company. Oral compositions containing dextranase. 4,115,546, Cl. 424-50.000.

Vigo, Tyrone L.: *See—*
Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., 4,115,422, Cl. 260-429.300.

Vinals, Joaquin F.: *See—*
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick Louis; and Vinals, Joaquin F., 4,115,431, Cl. 260-465.00F.

Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 2-Alkyl-4-phenyl-dihydropyrans and processes for augmenting the organoleptic properties of foodstuffs and tobacco using one or more of said pyrans. 4,115,406, Cl. 260-345.100.

Vincens, Rene, to Societe Anonyme pour l'Etude et la Promotion des Entreprises; and Vincens, Rene, part interest to each. Composite structure constituted standardized elements. 4,114,341, Cl. 52-580.000.

Vincent, David N.: *See—*
Vassiliades, Anthony E.; Vincent, David N.; and Shroff, Shrenik, 4,115,474, Cl. 260-855.000.

Viner, Brynley Emberley. Automatic screwdriver. 4,114,663, Cl. 144-32.00R.

Vinson, Carl G., Jr.: *See—*
Lemanski, Michael F.; Leitert, Frederick C.; and Vinson, Carl G., Jr., 4,115,323, Cl. 252-455.00R.

Vladimirov, Evgeny Evgenievich; Korchagin, Vladimir Gerasimovich; Sadomov, Jury Borisovich; and Khokhlov, Lev Mikhailovich. Special-purpose digital computer for computing statistical characteristics of random processes. 4,115,867, Cl. 364-900.000.

Vock, Manfred Hugo: *See—*
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,115,406, Cl. 260-345.100.

Vodopyanov, Jury Mikhailovich; Klimkin, Nikolai Emelyanovich; Savvateev, Ivan Ivanovich; Strelchenko, Vladimir Sergeevich; Kuris, Alexandr Pavlovich; and Koltsov, Sergei Ivanovich. Profile plano-type knurling machine. 4,114,415, Cl. 72-214.000.

Voegeli, Douglas W., to Minnesota Mining & Manufacturing Company. Process for producing a porous matrix. 4,115,500, Cl. 264-122.000.

Vogelgesang, Herbert: *See*—
Bier, Albert; and Vogelgesang, Herbert, 4,114,416, Cl. 72-238.000.

Voges, Fred Paul, to Consolidated Packaging, Inc. Container having braced partitions. 4,114,796, Cl. 229-27.000.

Vogt, Berthold Richard: *See*—
Wade, Peter C.; and Vogt, Berthold Richard, 4,115,555, Cl. 424-180.000.

Voinov, Nikolai Vasilievich: *See*—
Padalko, Oleg Vadimovich; Levit, Maxim Lvovich; and Voinov, Nikolai Vasilievich, 4,115,623, Cl. 428-566.000.

Volvo BM AB: *See*—
Bruun, Lars Ojvind, 4,114,666, Cl. 144-309.0AC.
Ericson, Hans Goran; and Steneras, Bo Sanfrid Emanuel, 4,114,720, Cl. 180-133.000.

VonHeck, Robert. Super-conforming seating system. 4,114,214, Cl. 5-367.000.

von Holdt, John W. Pivot mold assembly. 4,114,849, Cl. 249-58.000.

von Valtier, Eric. Method and apparatus for securing vibrato and tremolo effects. 4,114,499, Cl. 84-1.250.

Vornfett, Karl-Ulrich, to Friederich Justus & Co. Apparatus for feeding and checking separated longitudinal subjects. 4,114,488, Cl. 83-198.000.

Vul, Bentsion Moiseevich: *See*—
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.

Vynacron Dental Co.: *See*—
Daidone, Philip, 4,115,479, Cl. 260-884.000.

W. R. Bonsal Company: *See*—
Goeman, Friedrich, 4,115,135, Cl. 106-99.000.

W. R. Grace & Co.: *See*—
Dacey, Raymond B.; and Stringer, Frederick David, 4,114,756, Cl. 206-389.000.
Kleiner, Wayne E., 4,114,761, Cl. 206-591.000.

W. Schlafhorst & Co.: *See*—
Romic, Ivica, 4,114,931, Cl. 289-2.000.

Wada, Mitsuyoshi; Shimada, Hideyuki; and Ohta, Koji, to Kabushiki Kaisha Komatsu Seisakusho. Paving material agitation apparatus for use in water channel forming machine. 4,115,023, Cl. 404-98.000.

Waddill, Harold G.: *See*—
Schulze, Heinz; and Waddill, Harold G., 4,115,360, Cl. 528-94.000.
Schulze, Heinz; and Wadd..., Harold G., 4,115,361, Cl. 260-47.0EN.

Wade, Peter C.; and Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz[de]-isoquinoline-1,3(2H)-diones. 4,115,555, Cl. 424-180.000.

Wadsworth, Milton E.; Miller, Jan D.; Herbst, John A.; Kolbe, John L.; and Hayden, Howard Wayne. Acid ferric sulfate leaching of copper sulfide concentrates. 4,115,221, Cl. 204-108.000.

Wagner, Kuno: *See*—
Schneider, Gottfried; Wagner, Kuno; and Patzelt, Heinz Wolfgang, 4,115,298, Cl. 260-2.300.

Wagner, Sigurd: *See*—
Kasper, Horst Manfred; Tell, Benjamin; and Wagner, Sigurd, 4,115,633, Cl. 429-191.000.

Wagner, Wolfgang. Automatic injecting apparatus. 4,114,619, Cl. 128-215.000.

Wahl, Josef: *See*—
Rabus, Friedrich; Wahl, Josef; and Grather, Gunter, 4,114,582, Cl. 123-148.00E.

Wakahara, Yasushi: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,115,815, Cl. 358-260.000.

Walker, Marvin E., to PPG Industries, Inc. Binder applicator for glass fibers. 4,115,088, Cl. 65-11.00W.

Walker, Peter J., to Midland-Ross Corporation. Apparatus for web caliper control. 4,114,528, Cl. 100-47.000.

Walker, Philip A., to Krautkramer-Branson, Incorporated. Ultrasonic velocity measuring method and apparatus. 4,114,455, Cl. 73-597.000.

Walker, Wellington Epler: *See*—
Vidal, Jose Luis; Mester, Zoltan Csaba; and Walker, Wellington Epler, 4,115,428, Cl. 260-449.00L.

Wallace, Rebecca; Ashton, Fraser E.; Perry, Malcolm B.; and Diena, Benito B., to Canadian Patents & Development Limited. Identification of *Neisseria gonorrhoeae*. 4,115,543, Cl. 424-8.000.

Walsh, Thomas Joseph, to Leeds & Northrup Company. Temperature measurement with three lead resistance thermometers. 4,114,446, Cl. 73-362.0AR.

Walsh, Thomas Joseph: *See*—
Hoopes, Howard Sherman; McClenahan, Robert William; Walsh, Thomas Joseph; and Zecca, James William, 4,115,785, Cl. 346-34.000.

Walworth, Bryant Leonidas: *See*—
Lang, Stanley Albert, Jr.; and Walworth, Bryant Leonidas, 4,115,097, Cl. 71-92.000.

Wambach, Allen Dale: *See*—
Phipps, Donald Lee, Jr.; and Wambach, Allen Dale, 4,115,333, Cl. 260-22.00R.

Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Multichromophoric ultraviolet stabilizers and their use in organic compositions. 4,115,348, Cl. 260-45.8NZ.

Ward, Charles E.: *See*—
Maurer, William C.; McDonald, William J., Jr.; and Ward, Charles E., 4,114,702, Cl. 175-107.000.

Ward, John Ambrose: *See*—
Hansen, Niels Junior; Ward, John Ambrose; Hintze, William; and Johnson, David Charles, 4,115,750, Cl. 337-107.000.

Ward, William J., III, to General Electric Company. Separation of hydrogen sulfide from gas mixture including carbon dioxide. 4,115,514, Cl. 423-232.000.

Warner-Lambert Company: *See*—
Wise, Lawrence D.; and Morrison, Glenn C., 4,115,565, Cl. 424-246.000.

Warren, Peter Carter, to Union Carbide Corporation. Wear resistant alpha alumina article useful to clean magnetic tape and the process of producing said. 4,114,226, Cl. 15-236.00R.

Washizawa, Yasuo: *See*—
Ikeda, Tomoaki; Mizobuchi, Yuzo; Nahara, Akira; Washizawa, Yasuo; Ono, Yoshihiro; and Tomotsu, Takeshi, 4,115,127, Cl. 96-85.000.

Watanabe, Makoto: *See*—
Hoshi, Juro; and Watanabe, Makoto, 4,114,830, Cl. 242-191.000.

Watanabe, Shoji: *See*—
Otani, Sugio; Watanabe, Shoji; and Araki, Tadashi, 4,115,527, Cl. 423-447.400.

Watanabe, Wataru: *See*—
Takagi, Satoshi; Watanabe, Wataru; and Yokota, Tadashi, 4,115,826, Cl. 360-96.000.

Watanabe, Yasuaki: *See*—
Ogasawala, Nobuhiko; Odazima, Mituo; and Watanabe, Yasuaki, 4,115,716, Cl. 310-153.000.

Watson, Paul R.: *See*—
Christner, Larry G.; Nagle, Dennis C.; and Watson, Paul R., 4,115,528, Cl. 423-449.000.

Watts, Herbert L., to Olin Corporation. Process for making peroxycarboxylic acid. 4,115,410, Cl. 260-348.250.

Watts, Leonard R.: *See*—
Harrison, Charles W.; and Watts, Leonard R., 4,115,245, Cl. 208-33.000.

Wean United, Inc.: *See*—
Huddleston, Paul W., 4,114,413, Cl. 72-5.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Lutz, Alfons, 4,114,945, Cl. 296-137.00E.

Webb, Daniel R.; Steinke, John R.; Berry, Robert W.; and Funsten, Stanard R., to Smith International, Inc. Method and apparatus for tunneling upwardly. 4,114,698, Cl. 173-1.000.

Weber, Richard Martin; and Bedenbender, John William, to Texas Instruments Incorporated. Broadband seismic energy source. 4,114,722, Cl. 181-114.000.

Weber, Rolf-Ortwin; Soder, Alfons; and Boksay, Istvan, to Hoechst Aktiengesellschaft. Cyclic diamine derivatives. 4,115,569, Cl. 424-250.000.

Weber, Rudolf; Pochandke, Winfried; and Schwadtke, Karl, to Henkel Kommanditgesellschaft auf Aktien. Sachets particularly for use in clothes driers. 4,114,284, Cl. 34-12.000.

Webster Spring Co. Inc.: *See*—
Levine, Alexander M.; and Ramsey, Henry R., 4,114,210, Cl. 5-260.000.
Levine, Alexander M.; Ramsey, Henry R.; and Martin, Robert T., 4,114,211, Cl. 5-261.000.
Pakradooni, Hamlin Andrus, 4,114,867, Cl. 267-97.000.

Weddendorf, Elmer R., to B/W Metals Company, Inc. Rotating cafeteria type food service counter with improved drive system. 4,114,541, Cl. 108-20.000.

Weed Eater, Inc.: *See*—
Ballas, George Charles, Sr., 4,114,269, Cl. 30-276.000.

Weekly, Jon L. Drawer. 4,114,967, Cl. 312-328.000.

Wegmann, Jerome B., to McNeil Corporation. Flow sensor. 4,114,560, Cl. 116-117.00R.

Weidler, Charles Harry, to AMP Incorporated. Displation type electrical connector. 4,114,975, Cl. 339-176.00M.

Weigelt, Christian: *See*—
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,115,443, Cl. 562-402.000.

Weiler, Ernest A. H., to Xerox Corporation. Method of manufacture of a xerographic microfield donor. 4,114,261, Cl. 29-624.000.

Weingart, Norman: *See*—
Shulman, Lawrence M.; and Weingart, Norman, 4,114,450, Cl. 73-489.000.

Weinshenker, Ned M.; and Anderson, Niels H., to Alza Corporation. Pharmaceutical composition containing prostadienoic acid for regulating gastric secretion. 4,115,545, Cl. 424-45.000.

Weinstock, Jacques; Lieber, Derek; and Hay, William Dunning, to Unit Process Assemblies, Inc. Backscatter instrument for measuring thickness of a continuously moving coated strip of substrate material. 4,115,690, Cl. 250-308.000.

Weisenberger, Gottfried, to Effbe-Werk Fritz Brumme & Co. K.G. Support apparatus being adjustable as to height and insulating vibrations for machines and the like. 4,114,845, Cl. 248-24.000.

Weiss, Virgil W.: *See*—
Deex, Oliver D.; and Weiss, Virgil W., 4,115,357, Cl. 528-294.000.

Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., to United States of America, Agriculture. Antibacterial textile finishes utilizing zirconyl acetate complexes of inorganic peroxides. 4,115,422, Cl. 260-429.300.

Welch, Gray Gurney, to Royal Cake Company. Filler capper machine. 4,114,524, Cl. 99-450.400.

Wellworthy Limited: *See—*
Speaight, David Clement, 4,114,519, Cl. 92-221.000.
Welwyn Hall Research Association: *See—*
Davidson, Richard Robertson, 4,115,187, Cl. 162-168.00R.
Wempe, Richard J.; and Polley, Richard B., to ACF Industries, Incorporated. Eduction pipe with guide sleeve and seal to draw liquid from the bottom and allow telescoping when tank top moves down under impact. 4,114,783, Cl. 222-398.000.
Wengenrod, Gunter: *See—*
Grandin, Friedrich-Hans; Fritsch, Werner; and Wengenrod, Gunter, 4,115,685, Cl. 219-155.000.
Wenger, Alfred, to Institut Dr. Ing. Reinhard Straumann AG. Device for measuring the density of liquid and gaseous substances and method for operating the device. 4,114,423, Cl. 73-30.000.
Wenrich, Richard A.: *See—*
Jarvis, Clarence W.; and Wenrich, Richard A., 4,114,321, Cl. 51-205.00R.
Wentworth, Robert S., Jr., to Borg-Warner Corporation. Bellows-type mechanical seal. 4,114,904, Cl. 277-88.000.
Wernli, Max, to Georg Fischer Aktiengesellschaft. Molding machine for producing casting molds. 4,114,677, Cl. 164-168.000.
Weseloh, William E.: *See—*
Orshansky, Elias, Jr., deceased; and Weseloh, William E., 4,114,475, Cl. 74-687.000.
Westerkamp, Douglas F.: *See—*
Jenis, Donald S.; Kuczkowski, Thomas A.; Mazer, Jack S.; and Westerkamp, Douglas F., 4,114,684, Cl. 165-82.000.
Western Geophysical Co. of America: *See—*
Hall, Ernest M., Jr., 4,114,970, Cl. 339-49.00R.
Paitson, John Lloyd; and Parker, Marion Lonnie, 4,114,723, Cl. 181-120.000.
Westinghouse Electric Corp.: *See—*
Bechet, Henri L. J.; and Vertongen, Jose J. A., 4,114,336, Cl. 52-280.000.
Doby, William P., 4,115,835, Cl. 361-370.000.
Kulkarni, Avinash D.; and Cleary, James G., 4,115,513, Cl. 423-56.000.
Luo, Fang-Chen, 4,115,799, Cl. 357-71.000.
Wetterlin, Kjell Ingvar Leopold, to Aktiebolaget Draco. Aerosol inhalation device. 4,114,615, Cl. 128-173.00R.
Wetzig, Werner: *See—*
Hums, Dieter; Hergeth, Friedrich; and Wetzig, Werner, 4,115,140, Cl. 106-120.000.
Wheel Service Co., Inc.: *See—*
Nelson, Eldrid W., 4,114,947, Cl. 297-344.000.
Wheeler Manufacturing Corporation: *See—*
Coblitz, Sanford E.; and Bjalme, Bengt G., 4,114,485, Cl. 82-4.00C.
White, Gerald A.: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,115,075, Cl. 48-197.00R.
White, Kenneth W., to Atlas Tool & Manufacturing Co. Adjustable handle bar assembly for rotary tiller. 4,114,471, Cl. 74-551.600.
White, Woodrow W.: *See—*
O'Brien, John T.; and White, Woodrow W., 4,115,435, Cl. 260-465.400.
Whitney, George Crosier, III, to Du Pont de Nemours, E. I., and Company. Magenta triphenylmethane antihalation dyes for photographic elements. 4,115,126, Cl. 96-84.00R.
Widner College: *See—*
Scott, Howard L., 4,115,549, Cl. 424-71.000.
Wiedemann, Achim, to Sandoz Ltd. Polyglycol ether derivatives. 4,115,457, Cl. 260-615.00B.
Wiese, Harold. Garment hanger. 4,114,786, Cl. 223-94.000.
Wiese, Winfred John, to Borg-Warner Corporation. Balanced mechanical seal with flow control. 4,114,900, Cl. 277-27.000.
Wiesen, Ernest J.: *See—*
Lange, Kai; Toefting, Verner; Wiesen, Ernest J.; and Lijewski, Robert R., 4,115,694, Cl. 250-363.00S.
Wilbarg, Robert R.: *See—*
Dyer, Donald R.; Johnson, Claude, Jr.; and Wilbarg, Robert R., 4,115,120, Cl. 96-36.200.
Wild, Albrecht: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,115,456, Cl. 260-613.00R.
Wildmoser, Martin Michael, to Arenco Machine Company. Sealing means. 4,115,182, Cl. 156-515.000.
Wilhelm Will KG: *See—*
Kramer, Klaus; Dietrich, Toni; and Braun, Peter, 4,115,802, Cl. 358-93.000.
Wilhelmsson, Wilhelm H. Device for drilling hole of predetermined depth. 4,115,017, Cl. 408-14.000.
Wilkins, John Thomas, to R. G. Dixon & Company Limited. Floor treating machines. 4,114,711, Cl. 180-6.500.
Wilkinson, Harold A. Intracranial pressure monitoring catheter. 4,114,603, Cl. 128-2.00R.
Wilkinson, Robert C.: *See—*
Dikeman, Forrest L.; and Wilkinson, Robert C., 4,114,449, Cl. 73-379.000.
Will Ross Inc.: *See—*
Forman, Hugh M., 4,114,640, Cl. 137-381.000.
Willem, Michel, to Ceraver S.A. Method for fixing a metallic armature on a non-metallic part. 4,114,676, Cl. 164-108.000.
Willenbacher, Erich: *See—*
Kirch, Otto; and Willenbacher, Erich, 4,114,546, Cl. 112-153.000.
Willett, Peter Ernest: *See—*
Davies, Robert William; and Willett, Peter Ernest, 4,114,872, Cl. 271-91.000.
William H. Rorer, Inc.: *See—*
Diamond, Julius; and Douglas, George H., 4,115,564, Cl. 424-244.000.
Douglas, George Henry; Studt, William Lyon; and Dodson, Stuart Alan, 4,115,647, Cl. 544-63.000.
William R. Selwood Limited: *See—*
Selwood, Peter Richard, deceased; Selwood, Timothy John, executor; Axtell, Martin John Shelley, executor; and Burton, John David, 4,115,041, Cl. 417-440.000.
Williams, Anthony Michael: *See—*
Hounsfield, Godfrey Newbold; and Williams, Anthony Michael, 4,115,697, Cl. 250-445.00T.
Williams, Arthur C. Light fixture support. 4,114,327, Cl. 52-28.000.
Williams, Clark Russell: *See—*
Renner, Karl H.; and Williams, Clark Russell, 4,114,366, Cl. 58-50.00R.
Williams, David E.; and Hoyt, Edwin D., to Amark Industries, Inc. Cartridge heater with improved thermocouple. 4,115,686, Cl. 219-523.000.
Williams, Ralph P.: *See—*
Baldwin, Bernard A.; Williams, Ralph P.; and Rohde, Raymond, 4,115,286, Cl. 252-46.300.
Williams, Richard W. Two way telephone amplifier. 4,115,658, Cl. 179-1.0HF.
Wilputte Corporation: *See—*
Naevestad, Roy, 4,115,203, Cl. 202-248.000.
Wilson, John Corner: *See—*
Pasieka, Arnold Roy; Wilson, John Corner; and Moruzi, George Alexander, 4,114,954, Cl. 302-14.000.
Windmoller & Holscher: *See—*
Achelpohl, Fritz; and Brinkmeier, Friedhelm, 4,114,520, Cl. 93-33.00H.
Achelpohl, Fritz; and Mundus, Friedhelm, 4,115,183, Cl. 156-515.000.
Winey, Donald A.: *See—*
Emmons, William D.; Kim, Samuel S.; and Winey, Donald A., 4,115,169, Cl. 156-71.000.
Winstead, Thomas W., to Extracorporeal Medical Specialties, Inc. Wave patterned support for dialyzer membrane. 4,115,273, Cl. 210-321.00A.
Winston, Roland, to United States of America, Energy. Cylindrical radiant energy direction device with refractive medium. 4,114,592, Cl. 126-270.000.
Wisconsin Centrifugal, Inc.: *See—*
Swisher, Calvin C., Sr., 4,115,019, Cl. 403-270.000.
Wise, Lawrence D.; and Morrison, Glenn C., to Warner-Lambert Company. 6,7-Dimethoxy-2-(4-thiomorpholinyl)-4-quinazolinamine and related sulfoxide and sulfone. 4,115,565, Cl. 424-246.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, to Miles Laboratories, Inc. Bicycloalkyl derivatives of prostaglandins 11-deoxy-PGE_2 acids and esters. 4,115,438, Cl. 562-498.000.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, to Miles Laboratories, Inc. Bicycloalkyl derivatives of prostaglandins PGE_1 alcohols. 4,115,453, Cl. 260-586.00G.
Wohlert, Andrew M.; and Haruch, James, to Riverbank Laboratories, Inc. Illuminated fishing lure. 4,114,305, Cl. 43-17.600.
Wolf, David Harvey: *See—*
Faup, John Joseph; and Wolf, David Harvey, 4,114,731, Cl. 187-29.00R.
Wolf, Franz: *See—*
Braun, Hans; Cieslok, Gunter; and Wolf, Franz, 4,114,490, Cl. 83-303.000.
Wolf, Karlheinz: *See—*
Perrey, Hermann; Wolf, Karlheinz; Eimers, Erich; Nonn, Konrad; and Hornle, Reinhold, 4,115,379, Cl. 260-163.000.
Wolf, Otto, to Licentia Patent-Verwaltungs-GmbH. Pneumatic rotary hammer device. 4,114,699, Cl. 173-109.000.
Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,115,402, Cl. 260-332.20A.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,115,573, Cl. 424-250.000.
Won, Vann Y. Leveling device for forming X-ray specimen. 4,115,689, Cl. 250-272.000.
Wong, John Lui, to Research Corporation. Bridgehead nitrogen analogs of poly-chlorinated cyclic hydrocarbon insecticides. 4,115,391, Cl. 260-290.0HL.
Wood, James Carlos; and Felcman, Frances Adolph, to Texas Instruments Incorporated. Impact printer driveshaft gear and bearing assembly. 4,115,014, Cl. 400-611.000.
Woodard, Kenneth E., Jr.; and Specht, Steven J., to Olin Corporation. Electrolytic cell having membrane enclosed anodes. 4,115,237, Cl. 204-258.000.
Wooding Corporation: *See—*
Wooding, Patrick J.; and Anderson, Clifton P., 4,115,654, Cl. 13-33.000.
Wooding, Patrick J.; and Anderson, Clifton P., to Wooding Corporation. Introduction of starting molten flux from the top of a crucible. 4,115,654, Cl. 13-33.000.
Woods, Claude A., to Woods Enterprises, Inc. Exhaust gas recirculation means. 4,114,370, Cl. 60-279.000.

Woods Enterprises, Inc.: *See—*
Woods, Claude A., 4,114,370, Cl. 60-279.000.
Wordsmith, Inc.: *See—*
Lowell, Arthur C., 4,115,870, Cl. 364-900.000.
Worner, Gunter: *See—*
Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, 4,114,472, Cl. 74-574.000.
Wortman, Harold. Quilt construction and method of making same. 4,115,610, Cl. 428-102.000.
Wozniak, Robert S.: *See—*
Orndorff, James A., Jr.; Wozniak, Robert S.; and Andrepont, John S., 4,114,556, Cl. 114-230.000.
Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 6-Nitro-or amino-4-chromanone oxime. 4,115,405, Cl. 260-345.200.
Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. N-Benzyl-4-chromanamines. 4,115,407, Cl. 260-345.200.
Wright, Lewis W.: *See—*
Capowski, Robert S.; Wright, Lewis W.; and Zimmerman, Terrence K., 4,115,854, Cl. 364-200.000.
Wright, Roger W.: *See—*
Bainard, Dean R.; and Wright, Roger W., 4,114,898, Cl. 277-9.000.
Wu, Chisung: *See—*
Karol, Frederick John; Wu, Chisung; Reichle, Walter Thomas; and Maraschin, Norma Jean, 4,115,425, Cl. 260-438.50R.
Wu, Yao Hua; and Lobeck, Walter G., Jr., to Mead Johnson & Company. 10-(Bis-pyrrolinyl) phenoxazines. 4,115,571, Cl. 424-248.560.
Wuest, Heinz: *See—*
Pavlovsky, Rudolf; and Wuest, Heinz, 4,114,281, Cl. 33-180.00R.
Wunderlich, Klaus: *See—*
Bien, Hans-Samuel; Klauke, Erich; and Wunderlich, Klaus, 4,115,378, Cl. 260-146.00T.
Wurst, Bert, to Robert Bosch GmbH. Pulse-supplied ignition system for internal combustion engines. 4,114,581, Cl. 123-148.00E.
Wyman, James C. Rotary motor. 4,115,045, Cl. 418-97.000.
Wyss, Pierre-Charles: *See—*
Fischer, Ulf; and Wyss, Pierre-Charles, 4,115,641, Cl. 536-23.000.
Xerox Corporation: *See—*
Deshpande, Narayan V., 4,114,535, Cl. 101-141.000.
Fischbeck, Kenneth H., 4,115,789, Cl. 346-140.00R.
Frey, Thomas M.; and Pond, Stephen F., 4,115,786, Cl. 346-74.100.
Hartke, David, 4,115,765, Cl. 340-324.0AD.
Hedstrom, Jerry W., 4,115,013, Cl. 400-249.000.
Marsh, Dana G., 4,115,115, Cl. 96-1.50R.
Monkelbaan, Edwin R., 4,114,431, Cl. 72-122.000.
Stolka, Milan; Pai, Damodar M.; and Yanus, John F., 4,115,116, Cl. 96-1.50R.
Weiler, Ernest A. H., 4,114,261, Cl. 29-624.000.
Yagusic, George J.; and Boronosky, Richard A., to General Time Corporation. Packaging of a semiconductor. 4,115,838, Cl. 361-388.000.
Yamada, Hideo: *See—*
Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,114,498, Cl. 84-1.190.
Yamada, Shigeru: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,114,497, Cl. 84-1.170.
Yamagata, Seiichi: *See—*
Tsuchida, Nobuo; Kohara, Tadashi; Morishita, Syozo; Yamagata, Seiichi; and Sakai, Masaaki, 4,114,358, Cl. 57-51.000.
Yamaguchi, Hiroaki; and Fujinami, Hiroshi, to Nippon Soken, Inc. Diagnostic system employing a magnetic field responsive apparatus. 4,115,764, Cl. 340-530.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, to Mitsubishi Chemical Industries, Ltd. Preparation of solid titanium trichloride. 4,115,532, Cl. 423-492.000.
Yamaguchi, Kazuo; Kakogawa, Genjiro; Hasuo, Masayoshi; Goko, Nobuaki; and Maruyama, Yasuo, to Mitsubishi Chemical Industries, Ltd. Preparation of solid titanium trichloride. 4,115,533, Cl. 423-492.000.
Yamaguchi, Masanobu: *See—*
Narihara, Katsuhiko; Nakasugi, Hajime; and Yamaguchi, Masanobu, 4,115,675, Cl. 219-10.410.
Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Integrated circuit having one-input terminal with selectively varying input levels. 4,115,706, Cl. 307-209.000.
Yamakawa, Yoshio; Yanagihara, Hiromichi; and Miura, Nobuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,114,569, Cl. 123-30.00D.
Yamaki, Takasi: *See—*
Sato, Hisato; Tazume, Masayuki; Yamaki, Takasi; Fujita, Yutaka; and Arai, Yoshi, 4,115,310, Cl. 252-299.000.
Yamamoto, Hiroshi; and Fukuoka, Shigetada, to Nippon Kogaku K.K. Reproduction apparatus for a game. 4,114,890, Cl. 273-237.000.
Yamamoto, Koichi: *See—*
Suzuki, Yoshiro; Kokubu, Yoshinori; Chiba, Jiro; Hara, Morihisa; Nagahara, Shigehiro; and Yamamoto, Koichi, 4,115,132, Cl. 106-53.000.
Yamamoto, Stephen Kazuo: *See—*
Selvin, Gerald Joseph; Oliver, Leland Wayne; Yamamoto, Stephen Kazuo; and Hogan, Clarence Vaughn, 4,114,976, Cl. 339-217.00S.
Yamamoto, Yoichi: *See—*
Fujimoto, Isao; Aiba, Masahiko; Yamamoto, Yoichi; and Makita, Tomoo, 4,115,787, Cl. 346-75.000.
Yamamoto, Yukio, to Yoshida Kogyo K.K. Exterior window unit. 4,114,331, Cl. 52-202.000.
Yamamoto, Yutaka: *See—*
Nakamura, Koji; Otaki, Haruo; Yamamoto, Yutaka; Shimizu, Noboru; Kawamura, Kiyoshi; and Sato, Seiichi, 4,115,398, Cl. 260-326.100.
Yamamura, Hideo; Matsuo, Katsuharu; and Nagai, Nobuyuki, to Tokyo Shibaura Electric Co., Ltd. Induction heating apparatus. 4,115,677, Cl. 219-10.49R.
Yamane, Mamoru: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Satomi, Yoshihito; Suzuka, Teruo; Miyake, Toshinobu; and Hirato, Mizuho, 4,115,324, Cl. 252-459.000.
Yamano, Seiichi: *See—*
Itoh, Tetsuro; Takahashi, Tetsuo; Kimura, Atsuyoshi; and Yamano, Seiichi, 4,115,111, Cl. 75-128.00P.
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing synthetic resin packed product assembly. 4,115,175, Cl. 156-172.000.
Yamasu Shoyu Kabushiki Kaisha: *See—*
Satoh, Tomokazu; Takezawa, Junichi; Kuninaka, Akira; Honma, Miyuki; and Ui, Michio, 4,115,538, Cl. 424-1.000.
Yamazaki, Yasuhiro: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,115,815, Cl. 358-260.000.
Yanagihara, Hiromichi; and Habu, Nobuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary chamber. 4,114,568, Cl. 123-30.00D.
Yanagihara, Hiromichi: *See—*
Yamakawa, Yoshio; Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,114,569, Cl. 123-30.00D.
Yano, Naomichi, to Kubota Ltd. Method of producing cement panels reinforced with fibers. 4,115,501, Cl. 264-133.000.
Yanus, John F.: *See—*
Stolka, Milan; Pai, Damodar M.; and Yanus, John F., 4,115,116, Cl. 96-1.50R.
Yarmalis, Mikolas Mikolo: *See—*
Gorina, Yulia Ivanovna; Kaljuzhnaya, Galina Alexandrovna; Kuznetsov, Andrei Vasilievich; Maximovsky, Sergei Nikolaevich; Nikiforov, Mikhail Borisovich; Vul, Bentsion Moiseevich; Ivannikova, Galina Evgenievna; Denis, Vintsentas Ionovich; Yarmalis, Mikolas Mikolo; and Repshis, Vitautas Ionovich, 4,115,163, Cl. 148-175.000.
Yassa, Narges: *See—*
Shafiee, Ali; Lalezari, Iraj; and Yassa, Narges, 4,114,314, Cl. 47-85.000.
Yasuda, Kazuyoshi: *See—*
Kanki, Hiroshi; Yasuda, Kazuyoshi; and Tatsuke, Hisashi, 4,114,819, Cl. 242-18.00R.
Yasue, Shinya: *See—*
Fujimoto, Takeo; Torimaru, Yasuo; Ogawa, Shin-ichi; and Yasue, Shinya, 4,115,796, Cl. 357-42.000.
Yasui, Seimei: *See—*
Matsuda, Yoshinobu; Suzuki, Yukio; and Yasui, Seimei, 4,115,437, Cl. 260-513.00R.
Yata, Sizukuni: *See—*
Kimura, Isao; and Yata, Sizukuni, 4,115,364, Cl. 260-841.000.
Ydstie, Birger Leif, to Elkem-Spigerverket A/S. Matte smelting. 4,115,108, Cl. 75-11.000.
Yen, Jing G.: *See—*
Drees, Jan M.; Sonneborn, Walter G. O.; and Yen, Jing G., 4,115,031, Cl. 416-134.00A.
Yokomichi, Isao: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,115,102, Cl. 71-94.000.
Yokose, Yoshikazu: *See—*
Yamashita, Kazuo; Yokose, Yoshikazu; Akao, Masatake; Hirakawa, Koichi; Iho, Katsuhiko; and Shibano, Takashi, 4,115,175, Cl. 156-172.000.
Yokota, Tadashi: *See—*
Takagi, Satoshi; Watanabe, Wataru; and Yokota, Tadashi, 4,115,826, Cl. 360-96.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Variable load line power amplifier. 4,115,742, Cl. 330-297.000.
Yoshida, Kenji; Isogaya, Kazuyoshi; Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Kuboyama, Hisaharu, to Mitsui Toatsu Chemicals, Inc.; and Toyo Engineering Corporation. Gasification process. 4,115,074, Cl. 48-95.000.
Yoshida Kogyo K.K.: *See—*
Hasegawa, Mutsuo; Segawa, Sunichi; Koise, Yuji; Okada, Hisao; Gomyo, Shiro; and Kudo, Yoshiaki, 4,115,607, Cl. 427-387.000.
Yamamoto, Yukio, 4,114,331, Cl. 52-202.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Okawa, Taro, 4,114,342, Cl. 52-790.000.
Yoshida, Tadao; and Suzuki, Tadao, to Sony Corporation. Push-pull pulse amplifier having improved turn-on and turn-off times. 4,115,740, Cl. 330-264.000.
Yoshihara, Hiroshi; Tobita, Takashi; Tomizawa, Ryoichi; and Ishikawa, Kunio, to Nisso Petrochemical Industries Co., Ltd. Process for the production of alkylene glycol ether ester of organic carboxylic acid. 4,115,415, Cl. 260-410.000.

Yoshihara, Mitsuya: *See*—
Goto, Mikio; Sasano, Mitsunori; Oosawa, Koichi; and Yoshihara, Mitsuya, 4,114,576, Cl. 123-119.00A.

Yoshioka, Hachiro: *See*—
Masuda, Tetsuzo; Tagawa, Tomiyasu; Yoshioka, Hachiro; and Akahoshi, Takashi, 4,115,071, Cl. 422-179.000.

Yoshitomi, Shozo: *See*—
Okano, Masami; and Yoshitomi, Shozo, 4,114,323, Cl. 51-241.0VS.

Young, Austin H.; and Verbanac, Frank, to A. E. Staley Manufacturing Company. Water-absorbent starch copolymerizates. 4,115,332, Cl. 260-17.4GC.

Young, Chung I.: *See*—
Robins, Janis; Kropp, James E.; and Young, Chung I., 4,115,295, Cl. 528-90.000.

Young, Thomas A.; and Freimark, Ronald J., to Tenna Power Corporation. Multiphase to single phase and frequency converter system. 4,115,729, Cl. 322-86.000.

Yusa, Koue: *See*—
Miura, Yoshio; Kobayashi, Kazuhiro; and Yusa, Koue, 4,114,432, Cl. 72-135.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,115,793, Cl. 357-22.000.

Zaluska, Philip J.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,115,634, Cl. 521-126.000.

Zannucci, Joseph S.: *See*—
Wang, Richard H. S.; and Zannucci, Joseph S., 4,115,348, Cl. 260-45.8NZ.

Zasio, John J.: *See*—
Beall, Robert J.; and Zasio, John J., 4,115,837, Cl. 361-388.000.

Zavagli, Steven B.; and Kasik, Robert L., to Beatrice Foods Co. Bland neutralized casein. 4,115,376, Cl. 260-120.000.

Zecca, James William: *See*—
Hoopes, Howard Sherman; McClenahan, Robert William; Walsh, Thomas Joseph; and Zecca, James William, 4,115,785, Cl. 346-34.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Benzene-1,3,5-tris-acetoxime and the process for making phloroglucinol therewith. 4,115,451, Cl. 260-566.00A.

Zenith Radio Corporation: *See*—
de Weger, Dirk, 4,115,663, Cl. 179-15.0BT.

Zepp, Lawrence C.; and Mosteller, Marston D., to Bindicator Company. Optical sight tube for flowing fluid materials. 4,115,009, Cl. 356-201.000.

Zidek, Charles E. Mooring device and cleat. 4,114,553, Cl. 114-230.000.

Zildjian, Armand A., to Avedis Zildjian Company. Cymbal. 4,114,502, Cl. 84-402.000.

Zillessen, Christoph: *See*—
Radner, Gerd; and Zillessen, Christoph, 4,114,386, Cl. 405-150.000.

Zimmerman, Dennis M., to Eli Lilly and Company. 1-Azoniabicyclo[3.1.0]hexanes. 4,115,400, Cl. 260-326.50B.

Zimmerman, Terrence K.: *See*—
Capowski, Robert S.; Wright, Lewis W.; and Zimmerman, Terrence K., 4,115,854, Cl. 364-200.000.

Zinser Textilmaschinen GmbH: *See*—
Eckhardt, Friedrich, 4,114,356, Cl. 57-34.00R.

Zintgraff, Gary D.: *See*—
Chou, Ta Sen; and Zintgraff, Gary D., 4,115,644, Cl. 544-20.000.

Zirner, Joachim: *See*—
Henes, Gerhard; Muller, Hans Jurgen; Gupta, Pramod; and Zirner, Joachim, 4,115,373, Cl. 528-48.000.

Zobel, Siegfried: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Zobel, Siegfried, 4,115,792, Cl. 354-213.000.

Zoltan, Steven I., to Gould Inc. Laminated driver coil for recorder pen drive mechanism. 4,115,734, Cl. 324-151.00A.

Zschauer, Karl-Heinz: *See*—
Pawlik, Dieter; and Zschauer, Karl-Heinz, 4,115,162, Cl. 148-171.000.

Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,115,204, Cl. 203-60.000.

Zufich, Anthony C. Front load carrying apparatus for backpacks. 4,114,788, Cl. 224-25.00A.

Zumback Electronic AG: *See*—
Nopper, Peter, 4,115,702, Cl. 250-560.000.

Zur, Walter J., to Raymond Lee Organization, Inc., The, a part interest. Earring for pierced ear. 4,114,399, Cl. 63-12.000.

Zwack, Robert R.; and Jerabek, Robert D., to PPG Industries, Inc. Cataphoretic electrodeposition baths containing water-soluble lead salts. 4,115,226, Cl. 204-181.00C.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF SEPTEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Andeen, Gerry B.: *See—*
Crane, Hewitt D.; Taenzer, Jon C.; and Andeen, Gerry B., Re. 29,765, Cl. 73-432.00R.

Bauer, William, Jr.: *See—*
Niederhauser, Warren D.; Bauer, William, Jr.; Lane, Constance A.; and Belmares-Sarabia, Hector, Re. 29,772, Cl. 260-859.00R.

Baxter Travenol Laboratories, Inc.: *See—*
Kiesow, Lutz A., Re. 29,769, Cl. 23-230.00B.

Belmares-Sarabia, Hector: *See—*
Niederhauser, Warren D.; Bauer, William, Jr.; Lane, Constance A.; and Belmares-Sarabia, Hector, Re. 29,772, Cl. 260-859.00R.

Canon Kabushiki Kaisha: *See—*
Kohtani, Yutaka, Re. 29,776, Cl. 354-23.00D.

Crane, Hewitt D.; Taenzer, Jon C.; and Andeen, Gerry B., to SRI International. Strain gauge transducer system. Re. 29,765, Cl. 73-432.00R.

Cull, Neville L.; and Smith, Warren M., to Exxon Research & Engineering Co. Flue gas desulfurization sorbent. Re. 29,771, Cl. 252-455.00R.

D'Andrea, Corrado: *See—*
Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, Re. 29,770, Cl. 162-13.000.

Enercon Corporation, The: *See—*
Helmer, Robert, Re. 29,775, Cl. 318-302.000.

Exxon Research & Engineering Co.: *See—*
Cull, Neville L.; and Smith, Warren M., Re. 29,771, Cl. 252-455.00R.

Frito-Lay, Inc.: *See—*
Wisdom, Lawrence W.; and Hilton, Barney W., Re. 29,773, Cl. 426-49.000.

Futch, Max Gerald. Apparatus and method for use in assembling food on trays. Re. 29,767, Cl. 186-1.00D.

Gourmandy, Raymond: *See—*
Vidal, Roger; and Gourmandy, Raymond, Re. 29,774, Cl. 428-400.000.

Helmer, Robert, to Enercon Corporation, The. Controlled rotor motor. Re. 29,775, Cl. 318-302.000.

Hilton, Barney W.: *See—*
Wisdom, Lawrence W.; and Hilton, Barney W., Re. 29,773, Cl. 426-49.000.

Isorel S.A.: *See—*
Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, Re. 29,770, Cl. 162-13.000.

Kiesow, Lutz A., to Baxter Travenol Laboratories, Inc. Method and apparatus for deriving oxygen association rate curves for blood samples. Re. 29,769, Cl. 23-230.00B.

Kohtani, Yutaka, to Canon Kabushiki Kaisha. Exposure control device. Re. 29,776, Cl. 354-23.00D.

Lane, Constance A.: *See—*
Niederhauser, Warren D.; Bauer, William, Jr.; Lane, Constance A.; and Belmares-Sarabia, Hector, Re. 29,772, Cl. 260-859.00R.

Marechal, Bernard: *See—*
Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, Re. 29,770, Cl. 162-13.000.

Mehnert, Johannes S. Blow-molding apparatus. Re. 29,768, Cl. 425-535.000.

Niederhauser, Warren D.; Bauer, William, Jr.; Lane, Constance A.; and Belmares-Sarabia, Hector, to Rohm and Haas Company. Urethane elastomer with active hydrogen containing monoethylenically unsaturated monomer. Re. 29,772, Cl. 260-859.00R.

Poly-Wide, Inc.: *See—*
Wideman, Ronald H., Re. 29,766, Cl. 128-132.00D.

Rhone-Poulenc-Textile: *See—*
Vidal, Roger; and Gourmandy, Raymond, Re. 29,774, Cl. 428-400.000.

Rohm and Haas Company: *See—*
Niederhauser, Warren D.; Bauer, William, Jr.; Lane, Constance A.; and Belmares-Sarabia, Hector, Re. 29,772, Cl. 260-859.00R.

Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, to Isorel S.A.; and Selander, Stig Daniel. Manufacture of fiberboard according to the wet method with closed backwater system. Re. 29,770, Cl. 162-13.000.

Smith, Warren M.: *See—*
Cull, Neville L.; and Smith, Warren M., Re. 29,771, Cl. 252-455.00R.

SRI International: *See—*
Crane, Hewitt D.; Taenzer, Jon C.; and Andeen, Gerry B., Re. 29,765, Cl. 73-432.00R.

Taenzer, Jon C.: *See—*
Crane, Hewitt D.; Taenzer, Jon C.; and Andeen, Gerry B., Re. 29,765, Cl. 73-432.00R.

Vidal, Roger; and Gourmandy, Raymond, to Rhone-Poulenc-Textile. Elongated textile product. Re. 29,774, Cl. 428-400.000.

Wideman, Ronald H., to Poly-Wide, Inc. Method of and means for treating burn victims. Re. 29,766, Cl. 128-132.00D.

Wisdom, Lawrence W.; and Hilton, Barney W., to Frito-Lay, Inc. Process for producing potato chips. Re. 29,773, Cl. 426-49.000.

LIST OF PLANT PATENTEES

Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara": *See—*

Holtkamp, Reinhold, 4,302, Cl. 69.000.

Holtkamp, Reinhold, 4,303, Cl. 69.000.

Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,302, 9-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,303, 9-19-78, Cl. 69.000.

Williams, Ernest D. Miniature rose plant. 4,305, 9-19-78, Cl. 7.000.

Zaiger, Chris Floyd. Almond tree. 4,304, 9-19-78, Cl. 30.000.

LIST OF DESIGN PATENTEES

AAI Corporation: *See—*
Barr, Irwin R., 249,555, Cl. D25-21.000.
Barr, Irwin R., 249,556, Cl. D25-21.000.
Barr, Irwin R., 249,557, Cl. D25-21.000.
Barr, Irwin R., 249,560, Cl. D25-56.000.
Barr, Irwin R., 249,561, Cl. D25-56.000.
Barr, Irwin R., 249,562, Cl. D25-56.000.

AB Lyckeaborgs Bruk: *See—*
Blomqvist, Erik Mikael, 249,558, Cl. D25-35.000.
Blomqvist, Erik Mikael, 249,559, Cl. D25-35.000.

Abbott Laboratories: *See—*
Bujan, Albert Frank, 249,451, Cl. D8-18.000.

Ackerman, Anton; and Jones, William J., to Dynamic Designs, Inc. Knife holder. 249,443, 9-19-78, Cl. D7-74.000.

Adams, Patrick J., to Artex Hobby Products, Inc. Modular carrier for tubes of paint or similar articles. 249,589, 9-19-78, Cl. D87-1.00R.

Adkinson, Joseph E. Lounge chair. 249,414, 9-19-78, Cl. D6-69.000.

Adkinson, Joseph E. Dining room breakfront. 249,431, 9-19-78, Cl. D6-172.000.

Aldridge, Albert Horace; and Pizzey, Michael, to Thomas Ness Limited. Water filter. 249,542, 9-19-78, Cl. D23-4.000.

Altec Corporation: *See—*
Henricksen, Clifford A., 249,509, Cl. D14-37.000.

Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,404, 9-19-78, Cl. D6-30.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,405, 9-19-78, Cl. D6-30.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,406, 9-19-78, Cl. D6-31.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Tablet arm chair. 249,407, 9-19-78, Cl. D6-44.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,415, 9-19-78, Cl. D6-72.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,416, 9-19-78, Cl. D6-72.000.
Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 249,417, 9-19-78, Cl. D6-78.000.
American Optical Corporation: *See—*
Napoli, Joseph D., 249,548, Cl. D24-17.000.
Amerock Corporation: *See—*
Tegner, Raymond U. H., 249,418, Cl. D6-86.000.
Tegner, Raymond U. H., 249,419, Cl. D6-103.000.
Anchor Hocking Corporation: *See—*
Benes, Frank J.; and Thrush, James Lloyd, 249,439, Cl. D7-17.000.
Benes, Frank J.; and Thrush, James Lloyd, 249,445, Cl. D7-79.000.
Appleton, Thomas C.: *See—*
Cognata, Larry M.; and Appleton, Thomas C., 249,518, Cl. D15-12.000.
Application Des Gaz: *See—*
Vache, Marcel, 249,448, Cl. D7-110.000.
Arai, Kazuo, to Nissan Denshi Kabushiki Gaisha. Combined automobile radio transceiver and cartridge player. 249,506, 9-19-78, Cl. D14-7.000.
Ark Seal Corporation: *See—*
Sperber, Henry, 249,525, Cl. D15-122.000.
Artex Hobby Products, Inc.: *See—*
Adams, Patrick J., 249,589, Cl. D87-1.00R.
Arvey Corporation: *See—*
Gordon, William Donald, Sr., 249,578, Cl. D34-15.0LL.
Aspen Laboratories, Inc.: *See—*
Pike, Harold L., 249,549, Cl. D24-30.000.
Asprinio, Carmino T., to Tesoro Manufacturing Co., Inc. Font of type. 249,587, 9-19-78, Cl. D64-12.00B.
Atkinson, Robert J. Carrying case for a musical instrument. 249,584, 9-19-78, Cl. D56-1.00B.
Ball Corporation: *See—*
Campbell, William B., 249,485, Cl. D11-125.000.
Grunstad, Jerome A., 249,487, Cl. D11-139.000.
Bardane Manufacturing Company: *See—*
Horvick, Peter, 249,489, Cl. D11-162.000.
Barr, Irwin R., to AAI Corporation. Building structure. 249,555, 9-19-78, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Building structure. 249,556, 9-19-78, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Building structure. 249,557, 9-19-78, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Roof structure. 249,560, 9-19-78, Cl. D25-56.000.
Barr, Irwin R., to AAI Corporation. Roof structure. 249,561, 9-19-78, Cl. D25-56.000.
Barr, Irwin R., to AAI Corporation. Roof structure. 249,562, 9-19-78, Cl. D25-56.000.
Beatrice Foods Co.: *See—*
Lordahl, Var E., 249,477, Cl. D10-64.000.
Beattie, Lawrence: *See—*
Worthing, Robert; and Beattie, Lawrence, 249,583, Cl. D56-1.00A.
Bell, Richard A.: *See—*
Wallace, Earl C.; and Bell, Richard A., 249,495, Cl. D12-99.000.
Benes, Frank J.; and Thrush, James Lloyd, to Anchor Hocking Corporation. Bowl or similar article. 249,439, 9-19-78, Cl. D7-17.000.
Benes, Frank J.; and Thrush, James Lloyd, to Anchor Hocking Corporation. Storage jar or similar article. 249,445, 9-19-78, Cl. D7-79.000.
Benigni, Paul E.: *See—*
Schneider, Richard C.; Benigni, Paul E.; and Weaver, Allan E., 249,512, Cl. D14-42.000.
Bergman, Andrew I., to Quaker Oats Company, The. Toy drum. 249,577, 9-19-78, Cl. D34-15.00C.
Berkman, Joseph L. Carrying case for tape cartridges and cassettes. 249,590, 9-19-78, Cl. D87-1.00D.
Bernhardt, Daniel. Pie portion container. 249,491, 9-19-78, Cl. D9-219.000.
Bleed, Theodore Magnus, to Coats & Clark, Inc. Hanger bracket. 249,460, 9-19-78, Cl. D8-373.000.
Blomqvist, Erik Mikael, to AB Lyckeaborgs Bruk. Combined elastic frame and mold block for fireproof feed-through of electric cables or the like. 249,558, 9-19-78, Cl. D25-35.000.
Blomqvist, Erik Mikael, to AB Lyckeaborgs Bruk. Combined elastic frame and mold block for fireproof feed-through of electric cables or the like. 249,559, 9-19-78, Cl. D25-35.000.
Bonnett, Wayne A.: *See—*
Schwartz, Allen; and Bonnett, Wayne A., 249,462, Cl. D9-1.000.
Bonney, Fred J. Coal and wood stove. 249,544, 9-19-78, Cl. D23-97.000.
Brefka, Paul E.: *See—*
Turner, Robert Bruce; and Brefka, Paul E., 249,475, Cl. D10-57.000.
Brett, Colin, to Hoffmann-La Roche Inc. Hair microanalyzer. 249,530, 9-19-78, Cl. D16-48.000.
Brown, Coley T. Combined cooking and serving bowl. 249,447, 9-19-78, Cl. D7-97.000.
Brown, James D., to Lane Company, Inc., The. Buffet and china deck. 249,424, 9-19-78, Cl. D6-154.000.
Brynel Incorporated: *See—*
Glasberg, Myron, 249,401, Cl. D4-31.000.
Bujan, Albert Frank, to Abbott Laboratories. Opening tool for tear-open-type containers. 249,451, 9-19-78, Cl. D8-18.000.
Bullard, Edmund P., Sr.; and Togni, Gary A. Wood burning stove. 249,545, 9-19-78, Cl. D23-97.000.
Bullard, Edmund P., Sr.; and Togni, Gary A. Wood burning stove. 249,546, 9-19-78, Cl. D23-97.000.
Burke, William F.: *See—*
Shumway, DeWayne J.; and Burke, William F., 249,484, Cl. D10-112.000.
Burlington Industries, Inc.: *See—*
Carroll, Barry G., 249,468, Cl. D9-191.000.
Campbell, William B., to Ball Corporation. Christmas ornament. 249,485, 9-19-78, Cl. D11-125.000.
Cantor, Burton M. Non-lethal personal defense weapon. 249,535, 9-19-78, Cl. D22-1.000.
Carlsen, Roger Leonard, to Jacob Froehlich Cabinet Works Inc. Modular newsstand. 249,433, 9-19-78, Cl. D6-184.000.
Carroll, Barry G., to Burlington Industries, Inc. Pantyhose package. 249,468, 9-19-78, Cl. D9-191.000.
Cartex Corporation: *See—*
Pearson, Maxwell, 249,400, Cl. D2-361.000.
Carver, Robert Glynn. Fishing lure body. 249,536, 9-19-78, Cl. D22-27.000.
Castel, Lawrence: *See—*
Swinehart, Frank E.; and Castel, Lawrence, 249,461, Cl. D8-373.000.
Cattano, Peter A., Sr. Filter baffle plate. 249,541, 9-19-78, Cl. D23-4.000.
Center for Design Research and Development N.V.: *See—*
Ambasz, Emilio, 249,404, Cl. D6-30.000.
Ambasz, Emilio, 249,405, Cl. D6-30.000.
Ambasz, Emilio, 249,406, Cl. D6-31.000.
Ambasz, Emilio, 249,407, Cl. D6-44.000.
Ambasz, Emilio, 249,415, Cl. D6-72.000.
Ambasz, Emilio, 249,416, Cl. D6-72.000.
Ambasz, Emilio, 249,417, Cl. D6-78.000.
Chapman, Leon. Set of vehicle running boards. 249,501, 9-19-78, Cl. D12-203.000.
Chervenak, Robert A., to Comerco, Inc. Cabinet or similar article. 249,430, 9-19-78, Cl. D6-167.000.
Clairol Incorporated: *See—*
Levin, Monte L., 249,565, Cl. D28-58.000.
Coats & Clark, Inc.: *See—*
Bleed, Theodore Magnus, 249,460, Cl. D8-373.000.
Swinehart, Frank E.; and Castel, Lawrence, 249,461, Cl. D8-373.000.
Cognata, Larry M.; and Appleton, Thomas C., to Murray Ohio Manufacturing Co., The. Roto-tiller. 249,518, 9-19-78, Cl. D15-12.000.
Colman, Benjamin W.: *See—*
Rineman, Richard Lynn, 249,493, Cl. D12-64.000.
Comensoli, Leo John; and Smythe, Gloria Dawn, to Speedo Knitting Mills Pty, Limited. Fabric. 249,595, 9-19-78, Cl. D92-1.0EE.
Comerco, Inc.: *See—*
Chervenak, Robert A., 249,430, Cl. D6-167.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, to Pittway Corporation. Housing for fire and smoke detector. 249,481, 9-19-78, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, to Pittway Corporation. Housing for fire and smoke detector. 249,482, 9-19-78, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, to Pittway Corporation. Housing for fire and smoke detector. 249,483, 9-19-78, Cl. D10-106.000.
Coughlin, Ronald D.; and Pohlmann, Kenneth E., Jr. Audio speaker housing for protective helmets. 249,508, 9-19-78, Cl. D14-37.000.
Covey, Laird F., to Stanley Works, The. Handle for hand saw. 249,453, 9-19-78, Cl. D8-97.000.
Cox, Ronald A. Combined mudguard and light support for trucks. 249,500, 9-19-78, Cl. D12-185.000.
Cudahy, Murphy Dennis, III; and Mossey, Joseph Lloyd. Foldable portfolio with an adjustable easel. 249,532, 9-19-78, Cl. D19-35.000.
Cudahy, Murphy Dennis, III; and Mossey, Joseph Lloyd. Foldable portfolio with an adjustable easel. 249,533, 9-19-78, Cl. D19-35.000.
David, Vivian; and Emmerling, Ronald, to Drawbridge, Inc. Housing for T.V. game. 249,571, 9-19-78, Cl. D34-5.00L.
Del Grosso, Elaine V. Butterfly bow decoration for packages. 249,486, 9-19-78, Cl. D11-137.000.
Denney, Don W. Globe. 249,534, 9-19-78, Cl. D19-61.000.
Di Bonaventura, Alfred R., to Linemaster Switch Corporation, The. Foot operated control unit. 249,505, 9-19-78, Cl. D13-36.000.
Digital Equipment Corporation: *See—*
Schneider, Richard C.; Benigni, Paul E.; and Weaver, Allan E., 249,512, Cl. D14-42.000.
Dixson, Inc.: *See—*
Shumway, DeWayne J.; and Burke, William F., 249,484, Cl. D10-112.000.
Dorney Park Coaster Company, Inc.: *See—*
Ott, Robert F., 249,554, Cl. D25-9.000.
Doyel, John S. Battery operated press for cookies or the like. 249,440, 9-19-78, Cl. D7-43.000.
Dranger, Jan; and Huldt, Johan, to Innovator Design AB. Seat. 249,410, 9-19-78, Cl. D6-57.000.

Drawbridge, Inc.: *See*—
David, Vivian; and Emmerling, Ronald, 249,571, Cl. D34-5.00L.
Dunbar, George W., to Kusan, Inc. Combined toy loader and figure therefor. 249,576, 9-19-78, Cl. D34-15.0AN.
Dynamic Designs, Inc.: *See*—
Ackerman, Anton; and Jones, William J., 249,443, Cl. D7-74.000.
Eastman Kodak Company: *See*—
Olson, Richard Joseph, 249,511, Cl. D14-40.000.
Ebata, Takemi; and Miki, Kunishige, to Matsushita Electric Industrial Co. Tape recorder. 249,507, 9-19-78, Cl. D14-8.000.
Elfes, Lee E.; and Lorenz, Leo J., to Massey-Ferguson Inc. Tractor cab. 249,522, 9-19-78, Cl. D15-30.000.
Emmerling, Ronald: *See*—
David, Vivian; and Emmerling, Ronald, 249,571, Cl. D34-5.00L.
Excelsior Hardware Company: *See*—
Testa, Carmen, 249,456, Cl. D8-338.000.
Fazio, Dominick S.: *See*—
Wu, Paul S.; and Fazio, Dominick S., 249,510, Cl. D14-40.000.
Ferch, Rudolf, to Kastle Gesellschaft m.b.H. Ski. 249,575, 9-19-78, Cl. D34-14.00D.
Forsberg, Earl G. Ice bucket. 249,444, 9-19-78, Cl. D7-78.000.
Foster, Farrell T. Combined hoop roller and hoop. 249,572, 9-19-78, Cl. D34-5.0HP.
Framac Industries Pty. Limited: *See*—
Frank, James, 249,413, Cl. D6-67.000.
Frank, James, to Framac Industries Pty. Limited. Chair. 249,413, 9-19-78, Cl. D6-67.000.
Fratelli Saporiti: *See*—
Offredi, Giovanni, 249,409, Cl. D6-56.000.
Fukumoto, Noboru; and Inoue, Shyusuke, to Matsushita Electric Industrial Co., Ltd. Juicer. 249,441, 9-19-78, Cl. D7-49.000.
GAF Corporation: *See*—
Miller, Paul D.; and Svezia, John, 249,528, Cl. D16-23.000.
Gendreau, Simon, to Payge Manufacturing (1973) Limited. Combined bottle cap tightener and remover. 249,452, 9-19-78, Cl. D8-40.000.
General Engineering & Manufacturing Corporation: *See*—
Wallace, Earl C.; and Bell, Richard A., 249,495, Cl. D12-99.000.
General Foods Corporation: *See*—
Pettengill, Floyd E., 249,463, Cl. D9-58.000.
Gilligan, Patrick J., to Pako Corporation. Photographic printer. 249,529, 9-19-78, Cl. D16-34.000.
Giovagnoli, Paul S. Water still. 249,540, 9-19-78, Cl. D23-3.000.
Glasberg, Myron, to Brynel Incorporated. Hairbrush. 249,401, 9-19-78, Cl. D4-31.000.
Glaser, Ilma R. Handbag or similar article. 249,593, 9-19-78, Cl. D87-3.00D.
Gordon, William Donald, Sr., to Arvey Corporation. Toy barn. 249,578, 9-19-78, Cl. D34-15.0LL.
Graber-Rogg, Inc.: *See*—
Martin, Harold B.; and Rogg, Herman O., 249,585, Cl. D56-9.000.
Graham, Roger. Smoking device. 249,563, 9-19-78, Cl. D27-03.000.
Greenawalt, Monte H. Therapeutic apparatus. 249,551, 9-19-78, Cl. D24-36.000.
Grethey, Albert K.: *See*—
Moore, Walter E.; and Grethey, Albert K., 249,582, Cl. D52-3.00R.
Grunstad, Jerome A., to Ball Corporation. Plaque with sunk relief. 249,487, 9-19-78, Cl. D11-139.000.
Guodace, Ronald A., to International Silver Company. Article of flatware. 249,450, 9-19-78, Cl. D7-137.000.
Haffner, Donald Gene; and Woelffer, Neill Carl, to Jacobsen Manufacturing Company. Combined lawn mower and grass catcher. 249,519, 9-19-78, Cl. D15-14.000.
Halliwell, Keith, to Injectaform Pty. Limited. Angle joint for building system. 249,459, 9-19-78, Cl. D8-354.000.
Hanig, Harvey: *See*—
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,481, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,482, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,483, Cl. D10-106.000.
Hardy, Paul Robert: *See*—
Spencer, Arthur Thomas; and Hardy, Paul Robert, 249,503, Cl. D13-24.000.
Spencer, Arthur Thomas; and Hardy, Paul Robert, 249,504, Cl. D13-24.000.
Harold Leighton (Products) Limited: *See*—
Leighton, Harold, 249,402, Cl. D4-31.000.
Harris, Charles Roy, Jr. Tennis ball holder. 249,573, 9-19-78, Cl. D34-5.0ST.
Harris, David Peter, to Pye Limited. Phonograph record support stand or similar article. 249,434, 9-19-78, Cl. D6-185.000.
Helgesen, Paul E.; Mountain, Maurice G.; and Ripley, William S., III, to Susquehanna Broadcasting Co. Vintners' bin and cabinet. 249,421, 9-19-78, Cl. D6-130.000.
Helgesen, Paul E.; and Ripley, William S., III, to Susquehanna Broadcasting Co. Glassware hutch cabinet. 249,422, 9-19-78, Cl. D6-134.000.
Helgesen, Paul E.; and Ripley, William S., III, to Susquehanna Broadcasting Co. Caddy for tableware utensils or similar articles. 249,442, 9-19-78, Cl. D7-73.000.
Henricksen, Clifford A., to Altec Corporation. Acoustical transformer for coupling sound waves from the diaphragm to the throat of a horn-type loudspeaker. 249,509, 9-19-78, Cl. D14-37.000.
Hill, Clifford. Lawn decoration. 249,580, 9-19-78, Cl. D48-20.00E.
Hirma Richard Geinze GmbH & Co. KG: *See*—
Spellier, Roland, 249,454, Cl. D8-313.000.
Hoffmann-La Roche Inc.: *See*—
Brett, Colin, 249,530, Cl. D16-48.000.
Honeywell Inc.: *See*—
Kolbow, Donald P., 249,476, Cl. D10-60.000.
Hopper, Richard A. Drawing guide for music. 249,478, 9-19-78, Cl. D10-65.000.
Horvick, Peter, to Bardane Manufacturing Company. Crossbeam of a mock balance scale. 249,489, 9-19-78, Cl. D11-162.000.
Huldt, Johan: *See*—
Dranger, Jan; and Huldt, Johan, 249,410, Cl. D6-57.000.
Humphrey, Delby C.; and Humphrey, Robert D., to Schutt Manufacturing Company. Face guard for mounting on an athletic helmet. 249,397, 9-19-78, Cl. D2-233.000.
Humphrey, Robert D.: *See*—
Humphrey, Delby C.; and Humphrey, Robert D., 249,397, Cl. D2-233.000.
Igloo Corporation: *See*—
MacTavish, James A., 249,465, Cl. D9-170.000.
Parrish, David C., Sr., 249,466, Cl. D9-170.000.
Injectaform Pty. Limited: *See*—
Halliwell, Keith, 249,459, Cl. D8-354.000.
Innovator Design AB: *See*—
Dranger, Jan; and Huldt, Johan, 249,410, Cl. D6-57.000.
Inoue, Shyusuke: *See*—
Fukumoto, Noboru; and Inoue, Shyusuke, 249,441, Cl. D7-49.000.
International Silver Company: *See*—
Guodace, Ronald A., 249,450, Cl. D7-137.000.
Ishmael, Richard K. Picture holder. 249,435, 9-19-78, Cl. D6-233.000.
J & M Instruments Corp.: *See*—
Jungman, Maury, 249,480, Cl. D10-81.000.
Jackson, William P. Suspension chair and stand. 249,408, 9-19-78, Cl. D6-54.000.
Jacob Froehlich Cabinet Works Inc.: *See*—
Carlsen, Roger Leonard, 249,433, Cl. D6-184.000.
Jacobsen Manufacturing Company: *See*—
Haffner, Donald Gene; and Woelffer, Neill Carl, 249,519, Cl. D15-14.000.
Jankelson, Bernard; and Radke, John C., to Jankelson, Bernard. Muscle stimulating pulse generator. 249,550, 9-19-78, Cl. D24-36.000.
Johnson & Johnson: *See*—
Turner, Robert Bruce; and Brefka, Paul E., 249,475, Cl. D10-57.000.
Jones, John A. Ski rack. 249,425, 9-19-78, Cl. D6-157.000.
Jones, Richard E.; and Quiroz, Joseph R., to Schlage Lock Company. Box for a lock set. 249,467, 9-19-78, Cl. D9-185.000.
Jones, William J.: *See*—
Ackerman, Anton; and Jones, William J., 249,443, Cl. D7-74.000.
Jungman, Maury, to J & M Instruments Corp. pH Testing device. 249,480, 9-19-78, Cl. D10-81.000.
Kamata, Eitaro, to ShoeiSafety Helmet Corporation. Helmet. 249,396, 9-19-78, Cl. D2-232.000.
Kameyama Candle Co., Ltd.: *See*—
Tanikawa, Masashi, 249,588, Cl. D73-1.00R.
Kastle Gesellschaft m.b.H.: *See*—
Ferch, Rudolf, 249,575, Cl. D34-14.00D.
Kelling, Barbara A.: *See*—
Kelling, Kenneth J.; and Kelling, Barbara A., 249,579, Cl. D48-4.00A.
Kelling, Kenneth J.; and Kelling, Barbara A. Lantern holder. 249,579, 9-19-78, Cl. D48-4.00A.
Kira, Ken; Nakazawa, Kinshiro; and Yoshida, Katsuji, to Victor Company of Japan, Ltd. Combined radio receiver, tuner and amplifier. 249,515, 9-19-78, Cl. D14-72.000.
Kirschling, Charles J.: *See*—
Madl, Alfred W.; and Kirschling, Charles J., 249,446, Cl. D7-94.000.
Kishida, Shizuaki, to Sanyei Corporation. Plastic bag forming and sealing apparatus. 249,526, 9-19-78, Cl. D15-146.000.
Knapman, John Joseph. Necktie. 249,399, 9-19-78, Cl. D2-357.000.
Kohn, Saul Robert, to Youngs Drug Products Corporation. Dispensing container. 249,470, 9-19-78, Cl. D9-232.000.
Kolbow, Donald P., to Honeywell Inc. Thermostat cover. 249,476, 9-19-78, Cl. D10-60.000.
Kralevich, Boris. Golfer's tool. 249,574, 9-19-78, Cl. D34-5.0CB.
Kratky, Frank. Calf puller butt yoke. 249,568, 9-19-78, Cl. D30-99.000.
Kusan, Inc.: *See*—
Dunbar, George W., 249,576, Cl. D34-15.0AN.
Lamb, James M. Combined child's bed and amusement center. 249,403, 9-19-78, Cl. D6-6.000.
Lambitz, Robert H.; and Zeffero, Robert J., to Zefflamb Industries, Inc. Cargo box liner for pickup trucks. 249,494, 9-19-78, Cl. D12-98.000.
Lane Company, Inc., The: *See*—
Brown, James D., 249,424, Cl. D6-154.000.
Langworthy, Garfield: *See*—
Walker, Kenneth H.; Langworthy, Garfield; and Turner, Robert L., 249,423, Cl. D6-146.000.
Leighton, Harold, to Harold Leighton (Products) Limited. Hairbrush. 249,402, 9-19-78, Cl. D4-31.000.
LeRose, John T. Steering wheel. 249,499, 9-19-78, Cl. D12-175.000.
Letven, Ed: *See*—
Loeb, Kurt M., 249,514, Cl. D14-59.000.
Levin, Monte L., to Clairol Incorporated. Manicuring implement. 249,565, 9-19-78, Cl. D28-58.000.
Libonati, Michael R. Forearm carryall. 249,592, 9-19-78, Cl. D87-3.00R.

Lightfoot, Andrew O. Live-bait container. 249,539, 9-19-78, Cl. D22-14.000.
Linemaster Switch Corporation, The: *See—*
Di Bonaventura, Alfred R., 249,505, Cl. D13-36.000.
Litton Business Systems, Inc.: *See—*
Wu, Paul S.; and Fazio, Dominick S., 249,510, Cl. D14-40.000.
Loeb, Kurt M., to Letven, Ed, a part interest. Notepad attachment for a telephone. 249,514, 9-19-78, Cl. D14-59.000.
Lordahl, Var E., to Beatrice Foods Co. Faucet stem size guide. 249,477, 9-19-78, Cl. D10-64.000.
Lorenz, Leo J.: *See—*
Elfes, Lee E.; and Lorenz, Leo J., 249,522, Cl. D15-30.000.
MacTavish, James A., to Igloo Corporation. Plastic drum. 249,465, 9-19-78, Cl. D9-170.000.
Madi, Loretta. Cat bed. 249,567, 9-19-78, Cl. D30-41.000.
Madl, Alfred W.; and Kirschling, Charles J., to Oster Corporation. Sandwich maker. 249,446, 9-19-78, Cl. D7-94.000.
Mark VI Enterprises, Inc.: *See—*
Worthing, Robert; and Beattie, Lawrence, 249,583, Cl. D56-1.00A.
Martin, Harold B.; and Rogg, Herman O., to Graber-Rogg, Inc. Music rack. 249,585, 9-19-78, Cl. D56-9.000.
Massey-Ferguson Inc.: *See—*
Elfes, Lee E.; and Lorenz, Leo J., 249,522, Cl. D15-30.000.
Segales, Jaime, 249,523, Cl. D15-30.000.
Matsushita Electric Industrial Co.: *See—*
Ebata, Takemi; and Miki, Kunishige, 249,507, Cl. D14-8.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Fukumoto, Noboru; and Inoue, Shyusuke, 249,441, Cl. D7-49.000.
McKnight, Thomas J.: *See—*
Meier, Kenneth R.; and McKnight, Thomas J., 249,438, Cl. D7-5.000.
Meier, Kenneth R.; and McKnight, Thomas J. Beverage mug or the like. 249,438, 9-19-78, Cl. D7-5.000.
Mijares, Anthony J., Jr. Toothpick holder. 249,591, 9-19-78, Cl. D87-1.00R.
Miki, Kunishige: *See—*
Ebata, Takemi; and Miki, Kunishige, 249,507, Cl. D14-8.000.
Miller, Gerald K.: *See—*
Rink, Richard J.; and Miller, Gerald K., 249,502, Cl. D13-24.000.
Miller, Paul D.; and Svezia, John, to GAF Corporation. Motion picture projector. 249,528, 9-19-78, Cl. D16-23.000.
Mohawk Data Sciences Corp.: *See—*
Zierhut, Clarence D., 249,513, Cl. D14-45.000.
Moore, Walter E.; and Grethey, Albert K., to UMC Industries, Inc. Front door for a vending machine. 249,582, 9-19-78, Cl. D52-3.00R.
Moran, Carlo J. Horse foot pick. 249,569, 9-19-78, Cl. D30-99.000.
Morgan, George W. Tricycle. 249,496, 9-19-78, Cl. D12-112.000.
Morley, Blanche A. Dual bowling ball caddy. 249,492, 9-19-78, Cl. D12-33.000.
Mossey, Joseph Lloyd: *See—*
Cudahy, Murphy Dennis, III; and Mossey, Joseph Lloyd, 249,532, Cl. D19-35.000.
Cudahy, Murphy Dennis, III; and Mossey, Joseph Lloyd, 249,533, Cl. D19-35.000.
Mountain, Maurice G.; and Ripley, William S., III, to Susquehanna Broadcasting Co. Stoneware hutch cabinet. 249,420, 9-19-78, Cl. D6-127.000.
Mountain, Maurice G.: *See—*
Helgesen, Paul E.; Mountain, Maurice G.; and Ripley, William S., III, 249,421, Cl. D6-130.000.
Murai, Kanzi, to Tokyo Shibaura Electric Co., Ltd. Electronic copier. 249,521, 9-19-78, Cl. D16-30.000.
Murray Ohio Manufacturing Co., The: *See—*
Cognata, Larry M.; and Appleton, Thomas C., 249,518, Cl. D15-12.000.
Myers, Margaret J. Sleeping bag. 249,436, 9-19-78, Cl. D6-268.000.
Myers, Margaret J. Sleeping bag. 249,437, 9-19-78, Cl. D6-268.000.
Nakazawa, Kinshiro: *See—*
Kira, Ken; Nakazawa, Kinshiro; and Yoshida, Katsuji, 249,515, Cl. D14-72.000.
Napoli, Joseph D., to American Optical Corporation. Cardioresuscitation system package. 249,548, 9-19-78, Cl. D24-17.000.
Nartron Corporation: *See—*
Rink, Richard J.; and Miller, Gerald K., 249,502, Cl. D13-24.000.
Nash, Stanley P., to Schweiger Industries, Inc. Seat or similar article. 249,411, 9-19-78, Cl. D6-62.000.
Nash, Stanley P., to Schweiger Industries, Inc. Seat or similar article. 249,412, 9-19-78, Cl. D6-63.000.
National Biological Corporation: *See—*
Schwartz, Jack H., 249,552, Cl. D24-39.000.
Neufeld, Kurt. Jacket for a combined photo calculator and digital ruler. 249,531, 9-19-78, Cl. D19-3.000.
Neveux, Rene E., to Societe Anonyme Francaise du Ferodo. Modular storage unit. 249,427, 9-19-78, Cl. D6-159.000.
Nissan Denshi Kabushiki Gaisha: *See—*
Arai, Kazuo, 249,506, Cl. D14-7.000.
Offredi, Giovanni, to Fratelli Saporiti. Chair. 249,409, 9-19-78, Cl. D6-56.000.
Olsen, Robert H. Mooring whip base. 249,458, 9-19-78, Cl. D8-349.000.
Olson, Richard Joseph, to Eastman Kodak Company. Keyboard for electronic apparatus. 249,511, 9-19-78, Cl. D14-40.000.
Oster Corporation: *See—*
Madl, Alfred W.; and Kirschling, Charles J., 249,446, Cl. D7-94.000.
Ott, Robert F., to Dorney Park Coaster Company, Inc. Amusement park building. 249,554, 9-19-78, Cl. D25-9.000.
Oxford Laboratories, Inc.: *See—*
Sturm, Ronald Leo; and Smith, James Curtis, 249,553, Cl. D24-55.000.
Pako Corporation: *See—*
Gilligan, Patrick J., 249,529, Cl. D16-34.000.
Parduhn, Alfred P. Antenna mounting support. 249,517, 9-19-78, Cl. D14-91.000.
Parker, Douglas W. Fishing lure. 249,537, 9-19-78, Cl. D22-27.000.
Parrish, David C., Sr., to Igloo Corporation. Plastic drum. 249,466, 9-19-78, Cl. D9-170.000.
Parsons, Harley West. Jewelry display case. 249,426, 9-19-78, Cl. D6-158.000.
Payge Manufacturing (1973) Limited: *See—*
Gendron, Simon, 249,452, Cl. D8-40.000.
Pearce, John Scott: *See—*
Pearce, Mary Ellen; and Pearce, John Scott, 249,432, Cl. D6-183.000.
Pearce, Mary Ellen; and Pearce, John Scott. Combined planter and support. 249,432, 9-19-78, Cl. D6-183.000.
Pearson, Maxwell, to Cartex Corporation. Toy boxing glove. 249,400, 9-19-78, Cl. D2-361.000.
Pettengill, Floyd E., to General Foods Corporation. Jar. 249,463, 9-19-78, Cl. D9-58.000.
Pike, Harold L., to Aspen Laboratories, Inc. Electrosurgical handle. 249,549, 9-19-78, Cl. D24-30.000.
Pink, John J.; and Walter, Jerry L. Microwave oven. 249,449, 9-19-78, Cl. D7-128.000.
Pittway Corporation: *See—*
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,481, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,482, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,483, Cl. D10-106.000.
Pizzey, Michael: *See—*
Aldridge, Albert Horace; and Pizzey, Michael, 249,542, Cl. D23-4.000.
Pohlmann, Kenneth E., Jr.: *See—*
Coughlin, Ronald D.; and Pohlmann, Kenneth E., Jr., 249,508, Cl. D14-37.000.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
Stolarz, Edward M., 249,457, Cl. D8-338.000.
Pruitt, Arthur B., to Pruitt's Welding & Wood Burning Stove Shop, Inc. Wood burning stove. 249,547, 9-19-78, Cl. D23-97.000.
Pruitt's Welding & Wood Burning Stove Shop, Inc.: *See—*
Pruitt, Arthur B., 249,547, Cl. D23-97.000.
Pye (Electronic Products) Limited: *See—*
Spencer, Arthur Thomas; and Hardy, Paul Robert, 249,503, Cl. D13-24.000.
Spencer, Arthur Thomas; and Hardy, Paul Robert, 249,504, Cl. D13-24.000.
Pye Limited: *See—*
Harris, David Peter, 249,434, Cl. D6-185.000.
Quaker Oats Company, The: *See—*
Bergman, Andrew I., 249,577, Cl. D34-15.00C.
Quiroz, Joseph R.: *See—*
Jones, Richard E.; and Quiroz, Joseph R., 249,467, Cl. D9-185.000.
Radke, John C.: *See—*
Jankelson, Bernard; and Radke, John C., 249,550, Cl. D24-36.000.
Rappaport Exhibits, Inc.: *See—*
Stralka, Joseph F., 249,527, Cl. D16-14.000.
Rasmussen, Howard J., to Stewart-Warner Corporation. Timing meter. 249,479, 9-19-78, Cl. D10-78.000.
Regie Nationale des Usines Renault: *See—*
Tixier, Michel, 249,498, Cl. D12-163.000.
Reisman, Jay S. Emergency antenna. 249,516, 9-19-78, Cl. D14-86.000.
Rineman, Harold J.: *See—*
Rineman, Richard Lynn, 249,493, Cl. D12-64.000.
Rineman, Richard Lynn, to Rineman, Harold J.; Rineman, Richard Lynn; Young, S. Albert; and Colman, Benjamin W., part interest to each. Hull for a sailboat. 249,493, 9-19-78, Cl. D12-64.000.
Rink, Richard J.; and Miller, Gerald K., to Nartron Corporation. Electrical terminal. 249,502, 9-19-78, Cl. D13-24.000.
Ripley, William S., III: *See—*
Helgesen, Paul E.; Mountain, Maurice G.; and Ripley, William S., III, 249,421, Cl. D6-130.000.
Helgesen, Paul E.; and Ripley, William S., III, 249,422, Cl. D6-134.000.
Helgesen, Paul E.; and Ripley, William S., III, 249,442, Cl. D7-73.000.
Mountain, Maurice G.; and Ripley, William S., III, 249,420, Cl. D6-127.000.
Robertson, Roy C. A.: *See—*
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,481, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,482, Cl. D10-106.000.
Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 249,483, Cl. D10-106.000.
Robinson, Fuller, to Standard Desk Limited. Desk. 249,428, 9-19-78, Cl. D6-161.000.
Robinson, Fuller, to Standard Desk Limited. Credenza. 249,429, 9-19-78, Cl. D6-164.000.
Rogg, Herman O.: *See—*
Martin, Harold B.; and Rogg, Herman O., 249,585, Cl. D56-9.000.

Russert, Frank, to Warner-Lambert Company. Candy dispenser. 249,469, 9-19-78, Cl. D9-224.000.
Sackett, Ernest L.; and Sackett, Marvin E. Ashtray. 249,564, 9-19-78, Cl. D27-29.000.
Sackett, Marvin E.: *See—*
Sackett, Ernest L.; and Sackett, Marvin E., 249,564, Cl. D27-29.000.
Sanyei Corporation: *See—*
Kishida, Shizuaki, 249,526, Cl. D15-146.000.
Schlage Lock Company: *See—*
Jones, Richard E.; and Quiroz, Joseph R., 249,467, Cl. D9-185.000.
Schneider, Richard C.; Benigni, Paul E.; and Weaver, Allan E., to Digital Equipment Corporation. Computer system. 249,512, 9-19-78, Cl. D14-42.000.
Schutt Manufacturing Company: *See—*
Humphrey, Delby C.; and Humphrey, Robert D., 249,397, Cl. D2-233.000.
Schwartz, Allen; and Bonnett, Wayne A., to Sonoma Vineyards. Bottle. 249,462, 9-19-78, Cl. D9-1.000.
Schwartz, Jack H., to National Biological Corporation. Walk-in cabinet for radiation treatment of disease. 249,552, 9-19-78, Cl. D24-39.000.
Schweiger Industries, Inc.: *See—*
Nash, Stanley P., 249,411, Cl. D6-62.000.
Nash, Stanley P., 249,412, Cl. D6-63.000.
Segales, Jaime, to Massey-Ferguson Inc. Enclosure for a tractor type vehicle. 249,523, 9-19-78, Cl. D15-30.000.
ShoeiSafety Helmet Corporation: *See—*
Kamata, Eitaro, 249,396, Cl. D2-232.000.
Shumway, DeWayne J.; and Burke, William F., to Dixson, Inc. Engine timing light. 249,484, 9-19-78, Cl. D10-112.000.
Siegel, Owen R. Bench shooter figurine. 249,488, 9-19-78, Cl. D11-160.000.
Slider, John. Three piece convertible hardtop. 249,497, 9-19-78, Cl. D12-156.000.
Smali, Luigi A. G. Bottle. 249,464, 9-19-78, Cl. D9-149.000.
Smith, James Curtis: *See—*
Sturm, Ronald Leo; and Smith, James Curtis, 249,553, Cl. D24-55.000.
Smith, Turner C. Extension for a fire place damper lever. 249,543, 9-19-78, Cl. D23-127.000.
Smythe, Gloria Dawn: *See—*
Comensoli, Leo John; and Smythe, Gloria Dawn, 249,595, Cl. D92-1.0EE.
Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene E., 249,427, Cl. D6-159.000.
Sonoma Vineyards: *See—*
Schwartz, Allen; and Bonnett, Wayne A., 249,462, Cl. D9-1.000.
Speedo Knitting Mills Pty, Limited: *See—*
Comensoli, Leo John; and Smythe, Gloria Dawn, 249,595, Cl. D92-1.0EE.
Spellier, Roland, to Hirma Richard Geinze GmbH & Co. KG. Handle for furniture doors, drawers or the like. 249,454, 9-19-78, Cl. D8-313.000.
Spencer, Arthur Thomas; and Hardy, Paul Robert, to Pye (Electronic Products) Limited. Electrical connector. 249,503, 9-19-78, Cl. D13-24.000.
Spencer, Arthur Thomas; and Hardy, Paul Robert, to Pye (Electronic Products) Limited. Electrical connector. 249,504, 9-19-78, Cl. D13-24.000.
Sperber, Henry, to Ark Seal Corporation. Insulation application unit. 249,525, 9-19-78, Cl. D15-122.000.
Standard Desk Limited: *See—*
Robinson, Fuller, 249,428, Cl. D6-161.000.
Robinson, Fuller, 249,429, Cl. D6-164.000.
Stanley Works, The: *See—*
Covey, Laird F., 249,453, Cl. D8-97.000.
Stern, Walter, to Warner-Lambert Company. Candy dispenser. 249,471, 9-19-78, Cl. D9-235.000.
Steven Manufacturing Company: *See—*
Taylor, Beverly W.; and Thomas, Reet, Jr., 249,490, Cl. D9-191.000.
Stewart, Scott. Protective gaiter for snow skiers. 249,398, 9-19-78, Cl. D2-275.000.
Stewart, Scott. Back pack. 249,594, 9-19-78, Cl. D87-5.00R.
Stewart-Warner Corporation: *See—*
Rasmussen, Howard J., 249,479, Cl. D10-78.000.
Stolarz, Edward M., to Presto Lock Company, Division of Walter Kidde & Company, Inc. Draw bolt for luggage or the like. 249,457, 9-19-78, Cl. D8-338.000.
Stralka, Joseph F., to Rappaport Exhibits, Inc. Audio visual display cabinet. 249,527, 9-19-78, Cl. D16-14.000.
Studt, Leonard Earl. Combined golf ball marker and carrying clip therefor. 249,570, 9-19-78, Cl. D34-5.0CB.
Sturm, Ronald Leo; and Smith, James Curtis, to Oxford Laboratories, Inc. Pipette. 249,553, 9-19-78, Cl. D24-55.000.
Sumpter, Betty L. Peanut watch. 249,472, 9-19-78, Cl. D10-36.000.
Susquehanna Broadcasting Co.: *See—*
Helgesen, Paul E.; Mountain, Maurice G.; and Ripley, William S., III, 249,421, Cl. D6-130.000.
Helgesen, Paul E.; and Ripley, William S., III, 249,422, Cl. D6-134.000.
Helgesen, Paul E.; and Ripley, William S., III, 249,442, Cl. D7-73.000.
Mountain, Maurice G.; and Ripley, William S., III, 249,420, Cl. D6-127.000.
Svezia, John: *See—*
Miller, Paul D.; and Svezia, John, 249,528, Cl. D16-23.000.
Swinehart, Frank E.; and Castel, Lawrence, to Coats & Clark, Inc. Hanger bracket. 249,461, 9-19-78, Cl. D8-373.000.
Tanikawa, Masashi, to Kameyama Candle Co., Ltd. Candle. 249,588, 9-19-78, Cl. D73-1.00R.
Taylor, Beverly W.; and Thomas, Reet, Jr., to Steven Manufacturing Company. Toy transceiver package. 249,490, 9-19-78, Cl. D9-191.000.
Tegner, Raymond U. H., to Amerock Corporation. Stem for supporting a soap dish or the like. 249,418, 9-19-78, Cl. D6-86.000.
Tegner, Raymond U. H., to Amerock Corporation. Stem for supporting a towel tree or the like. 249,419, 9-19-78, Cl. D6-103.000.
Tesoro Manufacturing Co., Inc.: *See—*
Asprinio, Carmino T., 249,587, Cl. D64-12.00B.
Testa, Carmen, to Excelsior Hardware Company. Latch. 249,456, 9-19-78, Cl. D8-338.000.
Thomas Ness Limited: *See—*
Aldridge, Albert Horace; and Pizzey, Michael, 249,542, Cl. D23-4.000.
Thomas, Reet, Jr.: *See—*
Taylor, Beverly W.; and Thomas, Reet, Jr., 249,490, Cl. D9-191.000.
Thrush, James Lloyd: *See—*
Benes, Frank J.; and Thrush, James Lloyd, 249,439, Cl. D7-17.000.
Benes, Frank J.; and Thrush, James Lloyd, 249,445, Cl. D7-79.000.
Tilley, Alan G. Hinge. 249,455, 9-19-78, Cl. D8-323.000.
Tixier, Michel, to Regie Nationale des Usines Renault. Car radiator grille. 249,498, 9-19-78, Cl. D12-163.000.
Togni, Gary A.: *See—*
Bullard, Edmund P., Sr.; and Togni, Gary A., 249,545, Cl. D23-97.000.
Bullard, Edmund P., Sr.; and Togni, Gary A., 249,546, Cl. D23-97.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Murai, Kanzi, 249,521, Cl. D16-30.000.
Toledo Astronomical Association: *See—*
Wagoner, James E., 249,474, Cl. D10-45.000.
Turner, Robert Bruce; and Brefka, Paul E., to Johnson & Johnson. Electronic thermometer housing. 249,475, 9-19-78, Cl. D10-57.000.
Turner, Robert L.: *See—*
Walker, Kenneth H.; Langworthy, Garfield; and Turner, Robert L., 249,423, Cl. D6-146.000.
UMC Industries, Inc.: *See—*
Moore, Walter E.; and Grethey, Albert K., 249,582, Cl. D52-3.00R.
Vache, Marcel, to Application Des Gaz. Portable cartridge gas cooking stove. 249,448, 9-19-78, Cl. D7-110.000.
Van Mill, Michael D. Grain wagon. 249,520, 9-19-78, Cl. D15-27.000.
Varadi, Joseph. Combined printer and paper-holding slide. 249,586, 9-19-78, Cl. D64-11.00R.
Victor Company of Japan, Ltd.: *See—*
Kira, Ken; Nakazawa, Kinshiro; and Yoshida, Katsuji, 249,515, Cl. D14-72.000.
Von Clemm, Werner C. Push-on flashlight. 249,581, 9-19-78, Cl. D48-24.00A.
Wagoner, James E., to Toledo Astronomical Association. Combination sundial and nocturnal celestial timepiece. 249,474, 9-19-78, Cl. D10-45.000.
Walker-Grad Inc.: *See—*
Walker, Kenneth H.; Langworthy, Garfield; and Turner, Robert L., 249,423, Cl. D6-146.000.
Walker, Kenneth H.; Langworthy, Garfield; and Turner, Robert L., to Walker-Grad Inc. Mobile device for the display of advertising or entertainment, or for dispensing products. 249,423, 9-19-78, Cl. D6-146.000.
Wallace, Earl C.; and Bell, Richard A., to General Engineering & Manufacturing Corporation. Van. 249,495, 9-19-78, Cl. D12-99.000.
Walter, Jerry L.: *See—*
Pink, John J.; and Walter, Jerry L., 249,449, Cl. D7-128.000.
Wareham, Richard A. Suction cleaner upper housing and bag or the like. 249,524, 9-19-78, Cl. D15-62.000.
Warner-Lambert Company: *See—*
Russert, Frank, 249,469, Cl. D9-224.000.
Stern, Walter, 249,471, Cl. D9-235.000.
Weast, Gerald T. Telescopic sight mount for firearms. 249,538, 9-19-78, Cl. D22-7.000.
Weaver, Allan E.: *See—*
Schneider, Richard C.; Benigni, Paul E.; and Weaver, Allan E., 249,512, Cl. D14-42.000.
Wenger, Daniel L. Sun dial. 249,473, 9-19-78, Cl. D10-45.000.
Wilhelm, William. Bird feeder. 249,566, 9-19-78, Cl. D30-15.000.
Woelffer, Neill Carl: *See—*
Haffner, Donald Gene; and Woelffer, Neill Carl, 249,519, Cl. D15-14.000.
Worthing, Robert; and Beattie, Lawrence, to Mark VI Enterprises, Inc. Guitar machine. 249,583, 9-19-78, Cl. D56-1.00A.
Wu, Paul S.; and Fazio, Dominick S., to Litton Business Systems, Inc. POS Optical scanning station. 249,510, 9-19-78, Cl. D14-40.000.
Yoshida, Katsuji: *See—*
Kira, Ken; Nakazawa, Kinshiro; and Yoshida, Katsuji, 249,515, Cl. D14-72.000.
Young, S. Albert: *See—*
Rineman, Richard Lynn, 249,493, Cl. D12-64.000.
Youngs Drug Products Corporation: *See—*
Kohn, Saul Robert, 249,470, Cl. D9-232.000.
Zeffero, Robert J.: *See—*
Lambitz, Robert H.; and Zeffero, Robert J., 249,494, Cl. D12-98.000.
Zefflamb Industries, Inc.: *See—*
Lambitz, Robert H.; and Zeffero, Robert J., 249,494, Cl. D12-98.000.
Zierhut, Clarence D., to Mohawk Data Sciences Corp. Keyboard. 249,513, 9-19-78, Cl. D14-45.000.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 19, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8	4,114,198
49 A	4,114,199
51	4,114,200
209.7	4,114,201
423	4,114,197

CLASS 3

1.5	4,114,202

CLASS 4

160	4,114,205
172	4,114,206
317	4,114,203
319	4,114,207
324	4,114,204
366	4,114,208

CLASS 5

62	4,114,209
260	4,114,210
261	4,114,211
267	4,114,212
345 R	4,114,213
367	4,114,214
370	4,114,215

CLASS 7

116	4,114,216

CLASS 8

2.5 A	4,115,053
17	4,115,054
26	4,115,055
39 B	4,115,056
54	4,115,057
111	4,115,058
	4,115,059
	4,115,060
137	4,115,061

CLASS 10

85	4,114,217
86 R	4,114,218

CLASS 13

31	4,115,653
33	4,115,654

CLASS 14

16.1	4,114,219

CLASS 15

105	4,114,220
182	4,114,221
186	4,114,222
228	4,114,223
229 A	4,114,224
230.17	4,114,225
236 R	4,114,226
250.32	4,114,227
256.51	4,114,228
320	4,114,229
330	4,114,230
413	4,114,231

CLASS 16

35 R	4,114,232
95 R	4,114,233
114 R	4,114,234
139	4,114,235
142	4,114,236
145	4,114,237
157	4,114,238

CLASS 17

45	4,114,239

CLASS 23

230 B	Re.29,769
	4,115,062
	4,115,064
230 M	4,115,063
230.6	4,115,065
293 R	4,115,073

CLASS 24

67.11	4,114,240
81 CC	4,114,241
115 R	4,114,242

CLASS 29

25.14	4,114,243
25.41	4,114,244
156.4 R	4,114,245
451	4,114,246
453	4,114,247
460	4,114,248
513	4,114,249
517	4,114,250
527.7	4,114,251
563	4,114,252
566.2	4,114,253
571	4,114,254
	4,114,255
	4,114,256
572	4,114,257
596	4,114,258
603	4,114,259
623.1	4,114,260
624	4,114,261
628	4,114,262
630 R	4,114,263

CLASS 30

34.1	4,114,264
122	4,114,265
123	4,114,266
172	4,114,267
262	4,114,268
276	4,114,269
394	4,114,270

CLASS 32

2	4,114,271
8	4,114,272
22	4,114,273
	4,114,274
	4,114,275
26	4,114,276

CLASS 33

14	4,114,277
23 K	4,114,278
172 E	4,114,280
178 R	4,114,279
180 R	4,114,281
	4,114,282
337	4,114,283

CLASS 34

12	4,114,284
29	4,114,285
58	4,114,286
92	4,114,287
93	4,114,288
173	4,114,289

CLASS 35

9 B	4,114,292
28	4,114,293
31 C	4,114,294
31 R	4,114,290
36	4,114,291

CLASS 36

50	4,114,297
100	4,114,295
101	4,114,296

CLASS 40

110	4,114,298
152	4,114,300
389	4,114,301
545	4,114,299

CLASS 42

1 ST	4,114,302
51	4,114,303

CLASS 43

4	4,114,304
17.6	4,114,305

CLASS 46

1 R	4,114,306
	4,114,307
53	4,114,308
75	4,114,309
104	4,114,310
192	4,114,311
223	4,114,312
264	4,114,313

CLASS 47

61	4,114,315
64	4,114,316
85	4,114,314

CLASS 48

95	4,115,074
197 R	4,115,075

CLASS 49

209	4,114,317
215	4,114,318
488	4,114,319
491	4,114,320

CLASS 51

205 R	4,114,321
206 R	4,114,322
241 VS	4,114,323
295	4,115,076
296	4,115,077

CLASS 52

2	4,114,324
	4,114,325
28	4,114,326
	4,114,327
79.1	4,114,328
173 R	4,114,329
200	4,114,330
202	4,114,331
224	4,114,332
265	4,114,333
280	4,114,336
303	4,114,334
336	4,114,335
442	4,114,337
478	4,114,338
507	4,114,339
520	4,114,340
580	4,114,341
665	4,114,343
741	4,114,344
745	4,114,345
746	4,114,346
790	4,114,342

CLASS 53

54	4,114,349
79	4,114,350
157	4,114,351
300	4,114,347
389	4,114,355
433	4,114,348

CLASS 54

79	4,114,352

CLASS 55

2	4,115,078
43 BN	4,115,079
54	4,115,080
64	4,115,081
103	4,115,082
148	4,115,083
176	4,115,084
193	4,115,085

CLASS 56

13.3	4,114,353
295	4,114,354

CLASS 57

34 R	4,114,356
35	4,114,357
51	4,114,358
124	4,114,359
142	4,114,360
156	4,114,361

CLASS 58

4 A	4,114,362
23 BA	4,114,365
23 D	4,114,364
23 R	4,114,363
50 R	4,114,366

CLASS 59

85	4,114,367

CLASS 60

39.16 R	4,114,368
200 A	4,114,369
276	4,114,372
279	4,114,370
282	4,114,371
	4,114,373
302	4,114,374
372	4,114,375
548	4,114,376
589	4,114,377
	4,114,378
606	4,114,379
721	4,114,380

CLASS 62

28	4,115,086
386	4,114,395
406	4,114,396
516	4,114,397

CLASS 63

3	4,114,398
12	4,114,399

CLASS 64

3	4,114,400
7	4,114,401
15 B	4,114,402
	4,114,403
17 A	4,114,404

CLASS 65

3 C	4,115,087
11 W	4,115,088
19	4,115,089
25 A	4,115,090
99 A	4,115,091
	4,115,092

CLASS 66

75.2	4,114,405

CLASS 68

24	4,114,406
178	4,114,407

CLASS 70

128	4,114,408
225	4,114,409
339	4,114,410
421	4,114,411
441	4,114,412

CLASS 71

88	4,115,093
	4,115,094
90	4,115,095
92	4,115,096
	4,115,097
93	4,115,098
	4,115,099
94	4,115,100
	4,115,101
	4,115,102
98	4,115,103
105	4,115,104
113	4,115,105

CLASS 72

5	4,114,413
105	4,114,414
122	4,114,431
135	4,114,432
214	4,114,415
238	4,114,416
379	4,114,417
386	4,114,418

CLASS 73

1 G	4,114,419
15.6	4,114,420
17 R	4,114,421
23.1	4,114,422
30	4,114,423
40	4,114,424
	4,114,425
40.5 R	4,114,426
63	4,114,427
88 F	4,114,428
88.5 R	4,114,429
121	4,114,430
143	4,114,433
150 R	4,114,434
151.5	4,114,435
178 R	4,114,436
	4,114,437
194 A	4,114,438
	4,114,439
231 R	4,114,440
290 V	4,114,441
341	4,114,442
358	4,114,443
359 R	4,114,444
360	4,114,445
362 AR	4,114,446
	4,114,447
	4,114,448
379	4,114,449
432 R	Re.29,765
489	4,114,450
504	4,114,451
	4,114,452
517 R	4,114,453
579	4,114,454
597	4,114,455
622	4,114,456
632	4,114,457
729	4,114,458

CLASS 74

10.41	4,114,459
18.2	4,114,460
29	4,114,461
61	4,114,462
	4,114,463
89.14	4,114,464
89.17	4,114,465
117	4,114,466
255 R	4,114,467
410	4,114,468
424.8 VA	4,114,469
441	4,114,470
551.6	4,114,471
574	4,114,472
611	4,114,473
625	4,114,474
687	4,114,475
745	4,114,476
768	4,114,477
781 R	4,114,478
801	4,114,479
865	4,114,480

CLASS 75

0.5 AA	4,115,106
0.5 R	4,115,107
11	4,115,108
77	4,115,109
101 R	4,115,110
128 P	4,115,111
171	4,115,112
206	4,115,113

CLASS 81

64	4,114,481
421	4,114,482

CLASS 82

1.2	4,114,483
4 C	4,114,484
	4,114,485
12	4,114,486

CLASS 83

198	4,114,488
298	4,114,489
303	4,114,490
341	4,114,491
367	4,114,492
488	4,114,493
835	4,114,494

CLASS 84

1.01	4,114,495
1.1	4,114,496
1.17	4,114,497
1.19	4,114,498
1.25	4,114,499
330	4,114,501
385 P	4,114,500
402	4,114,502
422 S	4,114,503
453	4,114,504

CLASS 85

1 C	4,114,505
32 W	4,114,506
41	4,114,507
	4,114,508
84	4,114,509

CLASS 89

12	4,114,510
33 CA	4,114,511
36 K	4,114,512

CLASS 91

19	4,114,513
211	4,114,514
284	4,114,515
420	4,114,516

CLASS 92

2	4,114,517
208	4,114,518
221	4,114,519

CLASS 93

33 H	4,114,520

CLASS 96

1.4	4,115,114
1.5 R	4,115,115
	4,115,116
29 D	4,115,117
33	4,115,118
35.1	4,115,119
36.2	4,115,120
56.3	4,115,121
76 R	4,115,122
79	4,115,123
82	4,115,126
83	4,115,125
84 R	4,115,126
85	4,115,127
91 D	4,115,128
107	4,115,129

CLASS 98

36	4,114,521

CLASS 99

348	4,114,522
393	4,114,523
450.4	4,114,524
465	4,114,525
533	4,114,526

CLASS 100

2	4,114,527
47	4,114,528
53	4,114,529
87	4,114,530
90	4,114,531

CLASS 101

93.48	4,114,532
99	4,114,533
115	4,114,534
141	4,114,535
426	4,114,536

CLASS 102

24 HC	4,114,537

CLASS 104

88	4,114,538
165	4,114,539

CLASS 105

226	4,114,540

CLASS 106

15 R	4,115,130
47 Q	4,115,131
53	4,115,132
56	4,115,133
73.2	4,115,134
99	4,115,135
100	4,115,136
	4,115,137
	4,115,138
	4,115,139
120	4,115,140
288 B	4,115,141
	4,115,142
298	4,115,143
300	4,115,144

CLASS 108

20	4,114,541
157	4,114,542

CLASS 111

96	4,114,543

CLASS 112

104	4,114,544
121.15	4,114,545
153	4,114,546

178 4,114,547
258 4,114,548
410 4,114,549

CLASS 113

7 R 4,114,550

CLASS 114

98 4,114,551
227 4,114,552
230 4,114,553
4,114,556
264 4,114,393
298 4,114,554

CLASS 115

76 4,114,555

CLASS 116

67 R 4,114,557
114 PV 4,114,558
114.5 4,114,559
117 R 4,114,560
124 B 4,114,561

CLASS 118

50 4,114,562
63 4,114,563
626 4,114,564

CLASS 119

14.01 4,114,565

CLASS 123

25 B 4,114,566
30 A 4,114,567
30 D 4,114,568
4,114,569
32 EG 4,114,570
41.35 4,114,571
59 PC 4,114,572
117 D 4,114,573
117 R 4,114,574
119 A 4,114,575
4,114,576
4,114,577
124 R 4,114,578
139 AW 4,114,579
141 4,114,580
148 CC 4,114,583
148 E 4,114,581
4,114,582
179 G 4,114,584
191 M 4,114,585
195 A 4,114,586
196 S 4,114,587
198 F 4,114,588

CLASS 126

21 R 4,114,589
121 4,114,590
263 4,114,591
270 4,114,592
4,114,593
4,114,594
4,114,595
4,114,596
271 4,114,597
4,114,598
4,114,599
4,114,600

CLASS 127

5 4,115,145
38 4,115,146
54 4,115,147

CLASS 128

1 R 4,114,601
2 E 4,114,602
2 F 4,114,605
2 L 4,114,604
2 R 4,114,603
2.05 E 4,114,606
2.08 4,114,607
4,114,608
11 4,114,609
25 R 4,114,610
75 4,114,611
76 R 4,114,612
80 R 4,114,613
132 D Re.29,766
136 4,114,614
173 R 4,114 615
210 4,114,616
214 R 4,114,617
214.4 4,114,618
215 4,114,619
254 4,114,620
288 4,114,621
303.14 4,114,622
4,114,623
335 4,114,624
348 4,114,625
4,114,626
419 PG 4,114,628
419 PT 4,114,627

CLASS 131

15 R 4,114,629
17 R 4,114,630
84 C 4,114,631

CLASS 132

7 4,114,632

CLASS 134

21 4,115,148

CLASS 135

1 A 4,114,633
19.5 4,114,634

CLASS 136

89 PC 4,115,149

CLASS 137

3 4,114,635
43 4,114,636
116 4,114,637
242 4,114,638
246.22 4,114,639
381 4,114,640
430 4,114,641
436 4,114,642
495 4,114,643
565 4,114,644
596.17 4,114,645
601 4,114,646
624.2 4,114,647
625.19 4,114,649
625.5 4,114,648
625.63 4,114,650
630.14 4,114,651
4,114,652

CLASS 138

45 4,114,653
89 4,114,654
4,114,655
109 4,114,656
4,114,657

CLASS 139

452 4,114,658

CLASS 141

26 4,114,659
98 4,114,660
231 4,114,661
387 4,114,662

CLASS 144

32 R 4,114,663
134 D 4,114,664
286 R 4,114,665
309 AC 4,114,666

CLASS 148

1.5 4,115,150
9.5 4,115,151
4,115,152
4,115,153
4,115,154
12 F 4,115,155
12.7 N 4,115,156
23 4,115,157
31.55 4,115,158
105 4,115,159
111 4,115,160
4,115,161
171 4,115,162
175 4,115,163
4,115,164

CLASS 149

5 4,115,165
7 4,115,166
19.5 4,115,167
109.6 4,115,168

CLASS 150

0.5 4,114,668
1 4,114,667
8 4,114,669

CLASS 151

41.72 4,114,670

CLASS 152

209 R 4,114,671

CLASS 156

71 4,115,169
79 4,115,170
96 4,115,171
115 4,115,172
120 4,115,173
155 4,115,174
172 4,115,175
244.25 4,115,176
245 4,115,177
291 4,115,178
444 4,115,179
446 4,115,180
497 4,115,181
515 4,115,182
4,115,183
626 4,115,184
634 4,115,185

CLASS 157

1.24 4,114,672

CLASS 160

166 A 4,114,673
222 4,114,674

CLASS 162

13 Re.29,770
65 4,115,186
168 R 4,115,187
190 4,115,188
305 4,115,189

CLASS 164

4 4,114,675
108 4,114,676
168 4,114,677
207 4,114,678
426 4,114,679

CLASS 165

4 4,114,680
26 4,114,681
39 4,114,682
78 4,114,683
82 4,114,684
96 4,114,685
110 4,114,686

CLASS 166

51 4,114,687
246 4,114,688
249 4,114,689
261 4,114,690
276 4,114,691
293 4,114,692
305 R 4,114,693
318 4,114,694

CLASS 172

47 4,114,695
59 4,114,696
543 4,114,697

CLASS 173

1 4,114,698
109 4,114,699

CLASS 174

35 MS 4,115,656
35 R 4,115,655

CLASS 175

19 4,114,700
84 4,114,701
107 4,114,702
4,114,703
4,114,704
340 4,114,705

CLASS 176

3 4,115,190
4,115,191
40 4,115,192
87 4,115,193
4,115,194

CLASS 177

70 4,114,706
145 4,114,707
4,114,708
156 4,114,709

CLASS 178

[illegible] 4,115,657
[illegible] 4,114,710

CLASS 179

1 HF 4,115,658
4,115,659
2.5 R 4,115,660
15 BS 4,115,661
15 BT 4,115,663
15 BV 4,115,662
84 R 4,115,664
98 4,115,665
100.4 ST 4,115,666
115.5 VC 4,115,667
170.2 4,115,668

CLASS 180

6.5 4,114,711
21 4,114,712
27 4,114,713
54 A 4,114,714
64 A 4,114,715
68 R 4,114,716
69.1 4,114,717
89.14 4,114,718
90 4,114,719
133 4,114,720
155 4,114,724

CLASS 181

105 4,114,721
114 4,114,722
120 4,114,723
205 4,114,725

CLASS 182

5 4,114,726

CLASS 186

1 AC 4,114,727
1 D Re.29,767

CLASS 187

8.75 4,114,728
29 R 4,114,729
4,114,730
4,114,731

CLASS 188

73.2 4,114,732
196 BA 4,114,733
274 4,114,734
282 4,114,735

CLASS 191

12.4 4,114,736

CLASS 192

0.098 4,114,745
3 N 4,114,737
4 A 4,114,738
41 A 4,114,739
70.18 4,114,740
89 B 4,114,741
4,114,742
91 R 4,114,743
98 4,114,744
104 R 4,114,746
150 4,114,747

CLASS 193

33 4,114,748
35 C 4,114,749

CLASS 195

1.3 4,115,195
36 R 4,115,197
63 4,115,198
96 4,115,199
127 4,115,200

CLASS 196

46.1 4,115,201

CLASS 198

491 4,114,752
608 4,114,753

CLASS 200

5 R 4,115,670
61.91 4,115,671
144 B 4,115,672
315 4,115,673
329 4,115,674
331 4,115,669

CLASS 202

99 4,115,202
248 4,115,203

CLASS 203

60 4,115,204
4,115,205
4,115,206
4,115,207
81 4,115,208

CLASS 204

1 T 4,115,209
10 4,115,210
37 R 4,115,211
38 E 4,115,212
39 4,115,213
64 R 4,115,214
67 4,115,215
73 R 4,115,216
95 4,115,217
98 4,115,218
99 4,115,219
105 R 4,115,220
108 4,115,221
117 4,115,222
129.6 4,115,223
159.18 4,115,224
159.22 4,115,231
159.23 4,115,232
180 P 4,115,225
180 R 4,115,233
4,115,234
181 C 4,115,226
4,115,227
192 EC 4,115,228
195 R 4,115,230
195 S 4,115,229
4,115,235
254 4,115,236
258 4,115,237
290 F 4,115,239
290 R 4,115,238
296 4,115,240

CLASS 206

319 4,114,754
326 4,114,755
389 4,114,756
424 4,114,757
471 4,114,758
523 4,114,759
562 4,114,760
591 4,114,761

CLASS 208

33 4,115,241
4,115,242
4,115,243
4,115,244
4,115,245
56 4,115,246
62 4,115,247
112 4,115,248
120 4,115,249
4,115,250
4,115,251
139 4,115,252
4,115,253
4,115,254
143 4,115,255

CLASS 209

3 4,115,256
78 4,114,762
291 4,115,257

CLASS 210

15 4,115,258
22 A 4,115,259
34 4,115,260
40 4,115,261
42 S 4,115,262
60 4,115,263
63 R 4,115,264
68 4,115,265
80 4,115,266
136 4,115,267
150 4,115,268
4,115,269
169 4,115,270
247 4,115,271
266 4,115,272
321 A 4,115,273
321 R 4,115,274
386 4,115,275
425 4,115,276
436 4,115,277
488 4,115,278
521 4,115,279

CLASS 211

57.1 4,114,763
100 4,114,764

CLASS 214

1 QC 4,114,765
3 4,114,766
16.4 A 4,114,767
130 R 4,114,770
152 4,114,768
4,114,769
384 4,114,771
512 4,114,772
623 4,114,773

CLASS 215

250 4,114,774
324 4,114,775

CLASS 219

10.41 4,115,675
10.49 R 4,115,676
4,115,677
10.55 B 4,115,678
4,115,680
10.55 M 4,115,679
10.57 4,115,681
118 4,115,682
121 L 4,115,683
124.22 4,115,684
155 4,115,685
523 4,115,686

CLASS 220

22 4,114,776
267 4,114,778
288 4,114,779
408 4,114,784

CLASS 221

101 4,114,780

CLASS 222

326 4,114,781
382 4,114,782
398 4,114,783
545 4,114,785

CLASS 223

94 4,114,786

CLASS 224

2 D 4,114,787
25 A 4,114,788
42.1 E 4,114,789
45 S 4,114,838

CLASS 226

91 4,114,790
4,114,791

CLASS 227

8 4,114,792
63 4,114,793

CLASS 228

182 4,114,794

CLASS 229

23 R 4,114,795
27 4,114,796
31 R 4,114,797
43 4,114,798
44 CB 4,114,777
72 4,114,799

CLASS 232

1 C 4,114,800
17 4,114,801

CLASS 233

26 4,114,802
4,114,803

CLASS 235

92 DM 4,115,687
476 4,114,804

CLASS 236

1 C 4,114,806
1 E 4,114,807
1 G 4,114,805
87 4,114,808

CLASS 237

1 A 4,114,809

CLASS 239

15 4,114,810
288.5 4,114,811
492 4,114,812
500 4,114,813
689 4,114,814

CLASS 241

45 4,114,815
46.11 4,114,816
73 4,114,817
244 4,114,818

CLASS 242

18 A 4,114,820
18 R 4,114,819
43 R 4,114,821
47.01 4,114,822
4,114,823
55.53 4,114,824
84.21 R 4,114,825
85 4,114,826
86.51 4,114,827
118.3 4,114,828
157 R 4,114,829
191 4,114,830
194 4,114,831
4,114,832
199 4,114,833
200 4,114,834

CLASS 243

32 4,114,835

CLASS 244

1 N 4,114,836
26 4,114,837
84 4,114,843
118 R 4,114,839
152 4,114,840
166 4,114,841
180 4,114,842

CLASS 246

162 4,114,844

CLASS 248

24 4,114,845
68 CB 4,114,846
104 4,114,847
346 4,114,848

CLASS 249

58 4,114,849

CLASS 250

253 4,115,688
272 4,115,689
308 4,115,690

312 4,115,691
338 4,115,692
363 S 4,115,693
4,115,694
445 T 4,115,695
4,115,696
4,115,697
4,115,698
461 B 4,115,699
518 4,115,700
527 4,115,280
552 4,115,701
560 4,115,702
568 4,115,703

CLASS 251

86 4,114,850
88 4,114,851
138 4,114,852
149.6 4,114,853
306 4,114,856
324 4,114,857

CLASS 252

8.8 4,115,281
12.4 4,115,283
18 4,115,282
29 4,115,284
32.5 4,115,285
46.3 4,115,286
48.2 4,115,287
50 4,115,288
62.1 P 4,115,289
62.54 4,115,290
73 4,115,291
90 4,115,292
102 4,115,293
106 4,115,294
135 4,115,307
4,115,308
186 4,115,309
299 4,115,310
301.1 W 4,115,311
301.5 4,115,312
309 4,115,313
4,115,314
316 4,115,315
359 A 4,115,316
418 4,115,317
428 4,115,318
429 B 4,115,319
431 C 4,115,320
4,115,321
432 4,115,424
447 4,115,322
455 R Re.29,771
4,115,323
459 4,115,324
514 4,115,325
522 4,115,326

CLASS 254

1 4,114,858
122 4,114,854
175.5 4,114,855

CLASS 256

48 4,114,859
65 4,114,860
67 4,114,861

CLASS 260

2.3 4,115,298
6 4,115,305
17 A 4,115,306
17.2 4,115,327
17.4 CL 4,115,331
17.4 GC 4,115,332
22 CQ 4,115,370
22 R 4,115,333
24 4,115,328
25 4,115,329
26 4,115,330
28.5 AS 4,115,335
28.5 D 4,115,334
29.2 N 4,115,337
29.4 UA 4,115,338
29.6 HN 4,115,339
4,115,340
29.6 NR 4,115,336
33.2 R 4,115,341
33.4 P 4,115,342
33.6 SB 4,115,343
37 R 4,115,344
38 4,115,345
42.15 4,115,346
42.46 4,115,347
45.7 S 4,115,354
45.75 B 4,115,352
45.75 C 4,115,353
45.8 A 4,115,350
45.8 NT 4,115,349
45.8 NZ 4,115,348
45.9 NP 4,115,351
45.95 H 4,115,355
47 EN 4,115,361
112 R 4,115,375
112.5 R 4,115,374
120 4,115,376
146 T 4,115,378
151 4,115,377
163 4,115,379
186 4,115,380
207.1 4,115,381
239 A 4,115,382
4,115,383
239 E 4,115,384
239.1 4,115,385
281 P 4,115,386
286 R 4,115,387
287 B 4,115,388
289 D 4,115,389
290 HL 4,115,390
4,115,391
295.5 R 4,115,392
4,115,393
296 H 4,115,394
296 N 4,115,395
296 R 4,115,396
296 T 4,115,397
326.1 4,115,398
326.43 4,115,401
326.5 B 4,115,400
326.5 FN 4,115,399
332.2 A 4,115,402
340.9 R 4,115,403
343.3 R 4,115,404
345.1 4,115,406
345.2 4,115,405
4,115,407
346.11 4,115,408
347.3 4,115,409
348.25 4,115,410
348.26 4,115,411
380 4,115,412
390 4,115,413
397.5 4,115,414
410 4,115,415
413 4,115,416
4,115,417
429 R 4,115,418
4,115,419
4,115,420
4,115,421
429.3 4,115,422
429.5 4,115,423
438.5 R 4,115,425
448.2 E 4,115,426
4,115,427
449 L 4,115,428
4,115,433
453 SP 4,115,429
465 D 4,115,430
465 E 4,115,432
465 F 4,115,431
465.3 4,115,434
465.4 4,115,435
505 N 4,115,436
513 R 4,115,437
549 4,115,444
553 A 4,115,445
4,115,448
553 R 4,115,446
4,115,447
555 A 4,115,449
558 A 4,115,450
566 A 4,115,451
586 G 4,115,453
586 R 4,115,452
590 C 4,115,454
610 R 4,115,455
613 R 4,115,456
615 B 4,115,457
644 4,115,459
648 R 4,115,460
652.5 R 4,115,461
667 4,115,462
668 B 4,115,463
668 C 4,115,464
674 R 4,115,465
678 4,115,466
683 R 4,115,467
683.15 D 4,115,468
4,115,469
4,115,470
683.43 4,115,471
836 4,115,472
841 4,115,364
850 4,115,473
855 4,115,474
857 PE 4,115,475
859 R Re.29,772
880 R 4,115,476
4,115,477
4,115,478
884 4,115,479
885 4,115,480
900 4,115,481
957 4,115,482
980 4,115,483

CLASS 261

111 4,115,484
119 R 4,115,485

CLASS 264

1 4,115,486
16 4,115,487
17 4,115,488
23 4,115,489
26 4,115,490
45.1 4,115,491
49 4,115,492
61 4,115,493
89 4,115,494
90 4,115,495
94 4,115,496
115 4,115,497
119 4,115,498
122 4,115,499
4,115,500
133 4,115,501
173 4,115,502
184 4,115,503
221 4,115,504
234 4,115,562
242 4,115,505
250 4,115,506
267 4,115,507
310 4,115,508
331 4,115,509
347 4,115,510
4,115,511

CLASS 266

44 4,114,862
48 4,114,863
51 4,114,864
136 4,114,865

CLASS 267

64 R 4,114,866
97 4,114,867

CLASS 269

136 4,114,868

CLASS 270

37 4,114,869

CLASS 271

35 4,114,870
91 4,114,872
173 4,114,871

CLASS 272

61 4,114,873
71 4,114,874
133 4,114,875

CLASS 273

1 R 4,114,877
32 A 4,114,878
34 R 4,114,879
73 G 4,114,880
73 R 4,114,881
85 G 4,114,882
87 B 4,114,876
106 B 4,114,885
106.5 C 4,114,883
4,114,884
162 B 4,114,886
176 F 4,114,889
176 FA 4,114,887
176 L 4,114,888
237 4,114,890
250 4,114,891
265 4,114,892

CLASS 274

9 RA 4,114,893
23 R 4,114,894
4,114,895
37 4,114,896

CLASS 277

1 4,114,897
9 4,114,898
22 4,114,899
27 4,114,900
34.3 4,114,901
53 4,114,902
81 R 4,114,903
88 4,114,904
164 4,114,905
166 4,114,906
206 R 4,114,907
211 4,114,908

CLASS 279

1 Q 4,114,909
123 4,114,910

CLASS 280

11.37 F 4,114,911
12 H 4,114,913
12 KL 4,114,912
30 4,114,914
47.19 4,114,915
47.29 4,114,916
116 4,114,917
284 4,114,918
292 4,114,919
414 R 4,114,920
478 B 4,114,921
512 4,114,922
711 4,114,923
740 4,114,924

CLASS 281

45 4,114,925

CLASS 282

27.5 4,114,926

CLASS 285

7 4,114,927
18 4,114,928
45 4,114,929
334.5 4,114,930

CLASS 289

2 4,114,931

CLASS 291

33 4,114,932

CLASS 292

37 4,114,933
87 4,114,934
104 4,114,935
342 4,114,936

CLASS 293

85 4,114,937

CLASS 294

19 R 4,114,938
64 R 4,114,939
82 R 4,114,940
86 R 4,114,941

CLASS 296

23 G 4,114,942
23 MC 4,114,943
50 4,114,944
137 E 4,114,945

CLASS 297

191 4,114,946
344 4,114,947
397 4,114,948
445 4,114,949

CLASS 299

15 4,114,950
22 4,114,951

CLASS 301

5.7 4,114,952
63 DD 4,114,953

CLASS 302

14 4,114,954
15 4,114,955
66 4,114,956

CLASS 303

96 4,114,957

CLASS 305

56 4,114,958

CLASS 307

64 4,115,704
140 4,115,705
209 4,115,706
252 C 4,115,707
268 4,115,708
304 4,115,709
4,115,710
350 4,115,711

CLASS 308

3.5 4,114,959
10 4,114,960
237 R 4,114,961
238 4,114,962

CLASS 310

12 4,115,712
49 R 4,115,713
4,115,714
68 B 4,115,715
153 4,115,716

CLASS 312

184 4,114,963
198 4,114,964
209 4,114,965
245 4,114,966
328 4,114,967

CLASS 313

59 4,115,717
60 4,115,718
105 R 4,115,719
337 4,115,720

CLASS 315

3.5 4,115,721
52 4,115,722
84 4,115,723
169 TV 4,115,724
403 4,115,725

CLASS 316

1 4,114,968

CLASS 318

171 4,115,726
212 4,115,727
302 Re.29,775
318 4,115,728

CLASS 322

86 4,115,729

CLASS 324

0.5 A 4,115,730
52 4,115,731
72 4,115,732
99 D 4,115,733
151 A 4,115,734
158 F 4,115,735
4,115,736

CLASS 325

459 4,115,737

CLASS 329

105 4,115,738

CLASS 330

263 4,115,739
264 4,115,740
284 4,115,741
297 4,115,742

CLASS 331

14 4,115,743
16 4,115,744
17 4,115,745
90 4,115,746
94.5 M 4,115,747
111 4,115,748

CLASS 333

31 R 4,115,749

CLASS 337

107 4,115,750
323 4,115,751

CLASS 339

45 R 4,114,969
49 R 4,114,970
59 R 4,114,971
65 4,114,972
92 M 4,114,973
103 C 4,114,974
176 M 4,114,975
217 S 4,114,976
270 R 4,114,977

CLASS 340

3 C 4,115,752
6 R 4,115,753
27 R 4,115,754
4,115,755
4,115,756
32 4,115,757
52 R 4,115,758
146.1 F 4,115,759
146.3 AC 4,115,761
146.3 H 4,115,760
4,115,762
147 CV 4,115,849
166 R 4,115,763
324 AD 4,115,765
347 AD 4,115,766
347 CC 4,115,767
347 DD 4,115,768
373 4,115,769
396 4,115,770
530 4,115,764

CLASS 343

6 R 4,115,771
6.5 R 4,115,772
7 AG 4,115,773
17.7 4,115,774
18 B 4,115,775
100 ME 4,115,776
108 R 4,115,777
701 4,115,778
715 4,115,779
739 4,115,780
768 4,115,781
779 4,115,782
792 4,115,783
915 4,115,784

CLASS 346

34 4,115,785
74.1 4,115,786
75 4,115,787
4,115,788
140 R 4,115,789

CLASS 350

1.7 4,114,978
96.21 4,114,979
96.33 4,114,980
4,114,981
127 4,114,982
164 4,114,983
187 4,114,984
216 4,114,992
266 4,114,985
282 4,114,986
285 4,114,987
289 4,114,988
302 4,114,989
337 4,114,990
338 4,114,991

CLASS 351

160 4,114,993

CLASS 352

139 4,114,994
171 4,114,995
184 4,114,996

CLASS 353

11 4,114,997

CLASS 354

23 D Re.29,776
60 R 4,115,790
206 4,115,791
213 4,115,792

CLASS 355

3 DR 4,114,998
10 4,114,999
29 4,115,000
4,115,001
54 4,115,002
133 4,115,003

CLASS 356

106 LR 4,115,004
120 4,115,005
152 4,115,006
155 4,115,007
172 4,115,008
201 4,115,009
4,115,010
246 4,115,011

CLASS 357

22 4,115,793
23 4,115,794
24 4,115,795
42 4,115,796
46 4,115,797
64 4,115,798
71 4,115,799

CLASS 358

8 4,115,800
93 4,115,801
4,115,802
107 4,115,803
4,115,804
4,115,805
4,115,806
122 4,115,807
127 4,115,808
128 4,115,809
139 4,115,810
167 4,115,811
174 4,115,812
229 4,115,813
243 4,115,814
260 4,115,815
283 4,115,816
288 4,115,817

CLASS 360

5 4,115,818
14 4,115,819
33 4,115,820
72 4,115,821
74 4,115,822
77 4,115,823
80 4,115,824
85 4,115,825
96 4,115,826
121 4,115,827

CLASS 361

1 4,115,828
42 4,115,829
187 4,115,830
236 4,115,831
256 4,115,832
303 4,115,833
318 4,115,834
370 4,115,835
382 4,115,836
388 4,115,837
4,115,838

CLASSIFICATION OF PATENTS

393 4,115,839
400 4,115,840

CLASS 362

44 4,115,841
183 4,115,842
291 4,115,843
382 4,115,844
403 4,115,845

CLASS 364

101 4,115,847
107 4,115,848
200 4,115,846
4,115,850
4,115,851
4,115,852
4,115,853
4,115,854
4,115,855
4,115,856
474 4,115,857
4,115,858
476 4,115,859
492 4,115,860
497 4,115,861
500 4,115,862
521 4,115,863
550 4,115,864
604 4,115,865
900 4,115,866
4,115,867
4,115,868
4,115,869
4,115,870

CLASS 365

149 4,115,871
163 4,115,872

CLASS 400

202.1 4,115,012
248 4,114,751
249 4,115,013
279 4,114,750
611 4,115,014

CLASS 401

110 4,115,015

CLASS 403

16 4,115,016
270 4,115,019
322 4,115,020
353 4,115,021
359 4,115,022

CLASS 404

98 4,115,023

CLASS 405

25 4,114,394
94 4,114,381
150 4,114,386
163 4,114,390
176 4,114,391
186 4,114,389
207 4,114,392
216 4,114,388
260 4,114,384
264 4,114,382
282 4,114,383
293 4,114,387
298 4,114,385

CLASS 407

114 4,115,024

CLASS 408

6 4,115,025
10 4,115,026
14 4,115,017
239 A 4,115,018

CLASS 415

2 4,115,027
4,115,028
211 4,115,029

CLASS 416

93 R 4,115,030
134 A 4,115,031
227 A 4,115,032

CLASS 417

216 4,115,033
231 4,115,034
312 4,115,035
322 4,115,036
341 4,115,037
357 4,115,038
363 4,115,039
420 4,115,040
440 4,115,041
479 4,115,042
559 4,115,043
564 4,115,044

CLASS 418

97 4,115,045

CLASS 422

56 4,115,067
4,115,068
112 4,115,069
133 4,115,066
142 4,115,070
179 4,115,071
207 4,115,072

CLASS 423

24 4,115,512
56 4,115,513
232 4,115,514
235 4,115,515
239 4,115,516
243 4,115,517
244 4,115,518
279 4,115,519
287 4,115,520
294 4,115,521
322 4,115,522
387 4,115,523
415 A 4,115,524
425 4,115,525
440 4,115,526
447.4 4,115,527
449 4,115,528
472 4,115,529
488 4,115,530
4,115,531
492 4,115,532
4,115,533

CLASS 424

1 4,115,534
4,115,535
4,115,536
4,115,537
4,115,538
4,115,539
4,115,540
1.5 4,115,541
8 4,115,543
14 4,115,544
45 4,115,545
50 4,115,546
60 4,115,547
70 4,115,548
71 4,115,549
78 4,115,550
105 4,115,551
118 4,115,552
155 4,115,553
177 4,115,554
180 4,115,555
200 4,115,542
4,115,556
4,115,557
205 4,115,558
209 4,115,559
211 4,115,560
4,115,561
241 4,115,563
244 4,115,564
246 4,115,565
4,115,566
248.56 4,115,571
248.57 4,115,570
249 4,115,572
250 4,115,567
4,115,568
4,115,569
4,115,573
4,115,574
4,115,575
251 4,115,576
256 4,115,577
273 R 4,115,578
274 4,115,579
278 4,115,580
288 4,115,581
298 4,115,582
300 4,115,583
301 4,115,584
311 4,115,585
317 4,115,586
324 4,115,587
325 4,115,588
330 4,115,589
337 4,115,590

CLASS 425

29 4,115,046
72 R 4,115,047
4,115,048
111 4,115,049
535 Re.29,768

CLASS 426

7 4,115,591
32 4,115,592
49 Re.29,773
53 4,115,593
140 4,115,594
250 4,115,595
497 4,115,596
541 4,115,597
604 4,115,598

CLASS 427

55 4,115,599
79 4,115,600
96 4,115,601
140 4,115,602
326 4,115,603
329 4,115,604
377 4,115,605
386 4,115,606
387 4,115,607

CLASS 428

65 4,115,608
68 4,115,609
102 4,115,610
172 4,115,612
174 4,115,611
204 4,115,618
207 4,115,613
220 4,115,614
229 4,115,615
310 4,115,616
336 4,115,617
4,115,619
374 4,115,620
395 4,115,621
400 Re.29,774
409 4,115,622
566 4,115,623
617 4,115,624
641 4,115,625

CLASS 429

27 4,115,626
44 4,115,627
4,115,628
56 4,115,629
72 4,115,630
111 4,115,631
188 4,115,632
191 4,115,633

CLASS 431

352 4,115,050

CLASS 432

3 4,115,051
72 4,115,052

CLASS 521

32 4,115,297
53 4,115,303
115 4,115,302
126 4,115,634
155 4,115,301
167 4,115,304
170 4,115,299
171 4,115,300

CLASS 526

29 4,115,635
47.6 4,115,636
56 4,115,637
61 4,115,638
65 4,115,369
130 4,115,639

CLASS 528

18 4,115,356
48 4,115,373
73 4,115,372
90 4,115,295
92 4,115,296
94 4,115,360
131 4,115,366
132 4,115,365
170 4,115,359
190 4,115,362
196 4,115,358
210 4,115,367
229 4,115,368
279 4,115,371
294 4,115,357
4,115,363
483 4,115,640

CLASS 536

23 4,115,641
121 4,115,642

CLASS 544

16 4,115,643
20 4,115,644
4,115,645
27 4,115,646
63 4,115,647
110 4,115,648
140 4,115,649
324 4,115,650

CLASS 560

55 4,115,651

CLASS 562

402 4,115,439
4,115,443
498 4,115,438
533 4,115,440
534 4,115,441
548 4,115,442

CLASS 568

706 4,115,652
847 4,115,458

CLASSIFICATION OF DESIGNS

D2— 232 249,396
233 249,397
275 249,398
357 249,399
361 249,400
D4— 31 249,401
249,402
D6— 6 249,403
30 249,404
249,405
31 249,406
44 249,407
54 249,408
56 249,409
57 249,410
62 249,411
63 249,412
67 249,413
69 249,414
72 249,415
249,416
78 249,417
86 249,418
103 249,419
127 249,420
130 249,421
134 249,422
146 249,423
154 249,424
157 249,425
158 249,426
159 249,427
161 249,428
164 249,429
167 249,430
172 249,431
183 249,432
184 249,433
185 249,434
233 249,435
268 249,436
249,437
D7— 5 249,438
17 249,439
43 249,440
49 249,441
73 249,442
74 249,443
78 249,444
79 249,445
94 249,446
97 249,447
110 249,448
128 249,449
137 249,450
D8— 18 249,451
40 249,452
97 249,453
313 249,454
323 249,455
338 249,456
249,457
349 249,458
354 249,459
373 249,460
249,461
D9— 1 249,462
58 249,463
149 249,464
170 249,465
249,466
185 249,467
191 249,468
249,490
219 249,491
224 249,469
232 249,470
235 249,471
D10— 36 249,472
45 249,473
249,474
57 249,475
60 249,476
64 249,477
65 249,478
78 249,479
81 249,480
106 249,481
249,482
249,483
112 249,484
D11— 125 249,485
137 249,486
139 249,487
160 249,488
162 249,489
D12— 33 249,492
64 249,493
98 249,494
99 249,495
112 249,496
156 249,497
163 249,498
175 249,499
185 249,500
203 249,501
D13— 24 249,502
249,503
249,504
36 249,505
D14— 7 249,506
8 249,507
37 249,508
249,509
40 249,510
249,511
42 249,512
45 249,513
59 249,514
72 249,515
86 249,516
91 249,517
D15— 12 249,518
14 249,519
27 249,520
30 249,522
249,523
62 249,524
122 249,525
146 249,526
D16— 14 249,527
23 249,528
30 249,521
34 249,529
48 249,530
D19— 3 249,531
35 249,532
249,533
61 249,534
D22— 1 249,535
7 249,538
14 249,539
27 249,536
249,537
D23— 3 249,540
4 249,541
249,542
97 249,544
249,545
249,546
249,547
127 249,543
D24— 17 249,548
30 249,549
36 249,550
249,551
39 249,552
55 249,553
D25— 9 249,554
21 249,555
249,556
249,557
35 249,558
249,559
56 249,560
249,561
249,562
D27— 03 249,563
29 249,564
D28— 58 249,565
D30— 15 249,566
41 249,567
99 249,568
249,569
D34— 5 CB 249,570
249,574
5 HP 249,572
5 L 249,571
5 ST 249,573
14 D 249,575
15 AN 249,576
15 C 249,577
15 LL 249,578
D48— 4 A 249,579
20 E 249,580
24 A 249,581
D52— 3 R 249,582
D56— 1 A 249,583
1 B 249,584
9 249,585
D64— 11 R 249,586
12 B 249,587
D73— 1 R 249,588
D87— 1 D 249,590
1 R 249,589
249,591
3 D 249,593
3 R 249,592
5 R 249,594
D92— 1 EE 249,595

CLASSIFICATION OF PLANTS

P.— 7 4,305
30 4,304
69 4,302
4,303

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,114,303		4,115,556		4,114,425	4,115,797	4,114,782	4,114,751
4 :	4,114,492		4,115,560		4,114,451	4,115,827	4,114,816	4,114,757
	4,114,842		4,115,581		4,114,452	4,115,830	4,114,839	4,114,796
	4,115,713		4,115,582		4,114,460	4,115,837	4,114,879	4,114,798
	4,115,732		4,115,689		4,114,468	4,115,841	4,114,881	4,114,802
6 :	4,114,206		4,115,772		4,114,496	4,115,842	4,114,895	4,114,849
	4,114,226		4,115,828		4,114,526	4,115,858	4,114,910	4,114,850
	4,114,298		4,115,836		4,114,527	4,115,869	4,114,920	4,114,876
	4,114,322		4,115,840		4,114,532	4,115,870	4,114,948	4,114,882
	4,114,332	8 :	4,114,477		4,114,627	4,115,871	4,114,989	4,114,902
	4,114,422		4,114,688		4,114,637	4,115,872	4,115,011	4,114,912
	4,114,448		4,114,871		4,114,641	08 : 4,114,596	4,115,026	4,114,913
	4,114,475		4,115,110		4,114,667	4,114,665	4,115,034	4,114,927
	4,114,504		4,115,200		4,114,692	09 : 4,114,207	4,115,046	4,114,939
	4,114,509		4,115,658		4,114,698	4,114,268	4,115,247	4,114,958
	4,114,561	9 :	4,114,533		4,114,788	4,114,285	4,115,316	4,115,003
	4,114,604		4,114,949		4,114,834	4,114,455	4,115,374	4,115,025
	4,114,626		4,115,172		4,114,838	4,114,607	4,115,466	4,115,064
	4,114,647		4,115,611		4,114,868	4,114,608	4,115,503	4,115,067
	4,114,650		4,115,684		4,114,874	4,114,609	4,115,537	4,115,139
	4,114,653		4,115,753		4,114,880	4,114,803	4,115,608	4,115,252
	4,114,661		4,115,769		4,114,900	4,115,048	4,115,776	4,115,253
	4,114,697		4,115,838		4,114,936	4,115,070	13 : 4,114,277	4,115,254
	4,114,719	01 :	4,114,605		4,115,004	4,115,198	4,114,279	4,115,255
	4,114,730	04 :	4,114,315		4,115,007	4,115,302	4,114,299	4,115,332
	4,114,750		4,114,317		4,115,009	4,115,372	4,114,319	4,115,376
	4,114,801		4,114,808		4,115,027	4,115,385	4,114,549	4,115,455
	4,114,837		4,115,209		4,115,075	4,115,435	4,114,599	4,115,473
	4,114,843		4,115,340		4,115,167	4,115,528	4,114,732	4,115,474
	4,114,877		4,115,759		4,115,177	4,115,627	4,115,135	4,115,478
	4,114,878		4,115,843		4,115,270	4,115,700	14 : 4,115,262	4,115,594
	4,114,904		4,115,846		4,115,289	4,115,755	15 : 4,115,072	4,115,595
	4,114,906		4,115,847		4,115,300	4,115,816	17 : 4,114,283	4,115,610
	4,114,934		4,115,863		4,115,313	4,115,829	4,114,305	4,115,632
	4,114,952	06 :	Re.29,765		4,115,399	10 : 4,114,754	4,114,335	4,115,663
	4,114,956		4,114,204		4,115,484	4,114,886	4,114,354	4,115,674
	4,114,965		4,114,214		4,115,485	4,115,093	4,114,368	4,115,679
	4,114,978		4,114,247		4,115,544	4,115,142	4,114,389	4,115,680
	4,114,979		4,114,255		4,115,545	4,115,339	4,114,465	4,115,701
	4,114,991		4,114,259		4,115,558	4,115,345	4,114,516	4,115,741
	4,115,028		4,114,265		4,115,597	4,115,384	4,114,518	4,115,751
	4,115,042		4,114,290		4,115,616	4,115,481	4,114,540	4,115,757
	4,115,099		4,114,308		4,115,625	4,115,584	4,114,543	4,115,845
	4,115,149		4,114,309		4,115,635	12 : 4,114,209	4,114,553	18 : 4,114,218
	4,115,166		4,114,313		4,115,686	4,114,248	4,114,556	4,114,312
	4,115,185		4,114,321		4,115,691	4,114,267	4,114,567	4,114,330
	4,115,248		4,114,328		4,115,724	4,114,294	4,114,592	4,114,353
	4,115,249		4,114,381		4,115,726	4,114,340	4,114,629	4,114,396
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DESIGN PATENTS

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06 : 4,304
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